

Flight, March 30, 1916.

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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Flight.

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EDITORIAL COMMENT.



E are frankly disappointed at what may be regarded as the really first attack on Aviation in the House by Mr. Pemberton-Billing, the new air supremacy champion in Parliament.

We had hoped that for the moment the member for East Herts had temporarily lost his head under the novel surroundings at Westminster. But by his utterances in public since, it would appear as if this charitable explanation of his unnecessarily vehement

language last week cannot be accepted.

The Air War at Home. There can be no question upon one outcome of his methods. He has lost the sympathy of many men who were prepared to listen to his claims, and to whole-heartedly support the undoubtedly imperative calls of Aviation. The result, in our opinion, amounts to something akin to tragedy. Probably no M.P. ever entered Parliament with a more live and promising cause than Mr. Pemberton-Billing, a cause which needed only firm handling, combined with plain speaking, to ensure a reception which was a foregone conclusion. Goodness knows he had enough solid facts to handle without resort to hysterics. But wild accusations of murder may take a lot of explaining away when strict proof is called for. Much of "P.-B.'s" indictment was couched in terms more in keeping with the irresponsible ravings of third-rate sensational journalism rather than the measured views of a man in earnest for the welfare of his country. Mr. Pemberton-Billing must have

thought he was still addressing the gaping electoral crowds, which is a very regrettable step in the wrong direction. It is a very different audience he has to convince in the House of Commons, and it would perhaps be well for him—it certainly would be for Aviation—in good time, and before too late, to weigh well the expediency of continuing to draw his inspiration from whatever source may be feeding with dangerous fuel, the too ardent flame of criticism which burns spontaneously within him. The theatrical side of the speech savours far too much of the showman and of "yellow journalism" in its worst form, and in using loosely such terms as murder, the indignation and antagonism of most level-minded men are justly aroused, and National interests—in this case Aviation—must naturally suffer. The personalities unjustifiably introduced, are likely to tend to the classing of Mr. Pemberton-Billing with certain of the most virulent members of the House, and we are forced to come to the conclusion, if such tactics are persevered in, that the Air Service, which is so vitally important to the nation, is likely to be adversely affected rather than to gain from the new blood which has been introduced for putting life into its constitution. The tragedy of the rôle taken up by Mr. Pemberton-Billing is that by the adoption of the yellow journalism tactics he practically nullifies the respect which he otherwise would command for his constructive policy and for the many facts and good points which during his speech last week he was able to bring into prominence. Most of the suggestions put into concrete form by "B.-P." are familiar to the readers of "FLIGHT." By bringing them personally and prominently

before Parliament, the member for E. Herts is carrying out the mandate which he obtained from his constituents, to force Air Supremacy to the front with the Government. To weaken his efforts by such mistaken methods as he adopted in parts of his speech on Wednesday is, we think, in a manner to betray the charge which has been entrusted to him. He has many times abjured all connection with politics. Let him take himself to task as to whether he is not being dragged into the very vortex which he states he is so anxious to keep clear of. One only has to study the effect of those parts of the speech which were free from the violent rhetoric which marred parts of "P.-B.'s" effort, to realise how much greater weight was attached to a plain statement of a good case. When the yellow journalism phase was let loose, there were marked signs of disapproval from every part of the House. Let the Member for East Herts, in the great National Cause of Aeronautics, take heed in time and read the writing on the wall. He has the ball at his feet. It is for him by judicious manipulation to keep it rolling until it has reached the goal we all so much desire. Drop the "murder" business and force the Government's hands through public opinion by legitimate facts and advocacy, and all may still be well. Persist in the reverse, and we can see a very meteoric career for the newly-elected Air M.P. One fact which we should like to see substantiated by Mr. Pemberton-Billing would be the production of what he claimed was "the first journal ever published in the world in connection with flying, called *Aviation*," which he said he published and edited, and from which he made quotations. If the murder facts are as accurate as this claim, we think that a retraction of the term should be the only just outcome, instead of insistence that the term has not been misused. It is true that speeches in the House of Commons are outside the Defence of the Realm Act, but they are not exempt from public opinion. We support every reasonable effort and method to force the Government into recognising their responsibility to the Nation in connection with our Air Service, but this end is more likely to be achieved by methods other than those so far adopted by Mr. Pemberton-Billing.

* * *

A Contrast. By way of contrast, it is a pleasant relief to turn to the utterances of Lord Montagu, who holds the very strongest views upon the necessity for a paramount Air Service for the British Empire. Although a member of the new Co-ordination Committee, he has not hesitated to let his opinions be known. We commend to our readers the report of his speech, produced on another page, before the Liberal War Committee last week. If further demonstration of sound views, properly expressed, is needed, it is forthcoming from Lord Sydenham, who, as we have previously suggested, we should like to see "co-opted" to the Joint Committee. In a well-considered article in the *Times* on Tuesday on the question of the administration of the Air Service, Lord Sydenham analyses the Old Board of

Ordnance, its advantages and defects, and the reasons for its ultimate downfall. In this Board he sees a precedent for the present crisis in the Air Service. He points out that the destruction of the Board was due to difficulties and jealousies arising in relation to the *personnel* of the artillery and engineers, which arms, it was claimed, must be brought under uniform Army control. So far, therefore, the precedent, he thinks, tells against the establishment of a Board to provide and maintain the air service as a whole; but there are, he continues, important points of difference between the two cases. Lord Montagu and all who realise the present urgent needs of the new arm, and the certainty of great developments in the near future, see clearly the conditions which must be fulfilled. We require an air wing attached to the Navy to meet the requirements of fleets and squadrons, and another wing attached to the Army to carry out certain duties necessary for operations in the field. These wings have hitherto been provided and maintained by the Admiralty and War Office respectively, with the result of confusion, waste, and ill-ordered progress in certain respects. The principal uses of the air service cannot be secured by such means. It must be able to act as a separate arm, handled independently of the Navy and the Army by its own commanders under the direct orders of Government. It must create its own school of scientific thought, developing systems of strategy and tactics which may differ as much from naval and military systems as these do from each other. The consummate admiral cannot also be a consummate general, and it will be quite impossible for either to master all the problems of the air. Finally, the administration must fulfil the requirements of the whole Empire.

It follows that the air service can attain to full efficiency only if it is the sole care of a responsible Department of State. The advantages of entrusting construction, experiment and *materiel* generally to one body are obvious, and a halting step has already been taken in this direction, which is certain to prove disappointing because the new Joint Committee has no real powers. As regards *personnel*, the case of the artillery and engineers is not analogous. Their recruitment, organisation, and a great part of their training closely follow those of the other arms. With the air service the difference is organic. Airmen must specialise and concentrate upon their peculiar duties from the first. When their technical training is complete, units can be handed over to the admiral or to the general to learn their business as necessary adjuncts of a fleet or an army, and will then pass under naval or military command just as trawlers and auxiliary craft, whose crews may have had no naval training, take their place in a service involving much that is new to them. He therefore unhesitatingly comes to the conclusion that an Air Board, organised on the lines of the old Board of Ordnance, is imperatively required; but, at the same time, he strongly deprecates undue haste. The work should be put in hand without delay, however. Meanwhile, following the addition to the Army Council, either a new Lord should be added temporarily to the Board of Admiralty or one of the present Lords should receive full powers to deal with air questions, which are now the business of far too many officials, and have therefore been sadly mismanaged.

Lord Sydenham's constructive policy is always worthy of the closest consideration, and we are thus glad to learn so explicitly the lines upon which he also sees daylight for the future of the British Air Service.

Dope
Poisoning
Troubles.

One of the adverse problems which attach to aeroplane construction is once again brought into prominence by the dope poisoning death which was the subject of an inquest this month at Peterborough. The case was clearly due to the presence of the heavy fumes of tetrachlorethane, the ingredient which is deemed by many as the most efficient solvent of cellulose acetate. There was no question of the firm with whom the workman was employed having installed every possible safeguard against the trouble. The most scientific methods had been adopted to nullify any evil effects. But here again it was a case of familiarity breeding contempt, and it had been the custom, without the knowledge of the firm, of some of the employees to take their meals in the room where the poisonous dope was applied, and it was suggested at the inquest that this was really at the bottom of the fatality. However that may be, there is every reason why, when there are non-poisonous dopes on the market, the further use of any dope containing this vicious poison should be stopped as far as may be practicable. We have reason to believe that with this ingredient as

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part of the dope, a greater life for the fabric is obtained but, on the other hand, taking into consideration the length of life of a machine, is there any necessity to use such a material because the poisonous dope is likely to far outlast the machine itself? By foregoing some of the life of the fabric in excess of the machine's life, non-poisonous dopes can be employed with the best results. It has been recognised in France that the time has come for a move to be made against the possible sacrifice of human lives by this means, as last September a decree was issued, prohibiting the use of tetrachlorethane in dopes. In this connection it is worth noting that recently Mr. Roland in Parliament endeavoured to obtain some information regarding this very decree, but as he had omitted the formality of giving notice of his inquisitiveness, no enlightenment was forthcoming.

Possibly this fresh fatal case may be the means of bringing the matter prominently forward again with a view to eliminating so dangerous an item in connection with what is fast becoming one of the leading industries of the country.

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The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of the 21st inst. :—

E. H. Arnott and W. D. Longfield granted temporary commissions as Lieutenant, R.N.V.R., both with seniority March 20th, and appointed to "President," additional, for R.N.A.S.

S. F. Hollis entered as Warrant Officer, 2nd Grade, for temporary service, and appointed to "President," additional, for R.N.A.S. To date March 27th.

Chief Petty Officer, 3rd Grade, C. Dollery promoted to Warrant Officer, 2nd Grade. To date March 18th.

The following appeared among the Admiralty announcements of the 24th inst. :—

Probationary Flight Sub-Lieut. A. Mann to "President," additional, for R.N.A.S. March 23rd.

The following appeared among the Admiralty announcements of the 27th inst. :—

Temporary Sub-Lieut. (R.N.V.R.) V. E. Dean transferred to R.N.A.S. as Probationary Flight Sub-Lieutenant (temporary), with seniority of March 25th. The following have been entered as Probationary Flight Sub-Lieutenants, with seniority of Feb. 29th, and all appointed to "President," additional, for R.N.A.S.: J. F. Chisholm, A. T. Whealey and C. L. Bailey.

Royal Flying Corps (Military Wing).

THE following appeared in the London Gazette of the 21st inst. :
Balloon Officers.—Second Lieut. G. R. Robotham, Sherwood Foresters (Nottinghamshire and Derbyshire Regt.) (T.F.), and Second Lieut. Kenneth C. Cleaver, Special Reserve: March 1st, 1916.

Assistant Equipment Officers.—March 1st, 1916: Temporary Lieut. T. M. Wheeler, Lancashire Fusiliers (T.F.), Second Lieutenants, Special Reserve—B. F. Crane, A. H. L. Beale, J. F. Luscombe, S. Whitechurch, and F. Hitchins.

Memorandum.—Private Claude H. E. Ridpath from Royal Fusiliers (City of London Regt.), to be Temporary Second Lieutenant for duty with the R.F.C.; Feb. 26th, 1916.

Supplementary to Regular Corps.—To be Second Lieutenants (on probation): William F. Sullivan; Feb. 17th, 1916. Basil H. Hunt; March 1st, 1916. March 13th, 1916: Oliver C. Godfrey, Stanley W. Mann, and John Manley.

The following appeared in a supplement to the London Gazette issued on the 22nd inst. :—

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: Sydney S. Dixon, Frank Murphy, and Kenneth Mathewson.

To be Second Lieutenants (on probation); Feb. 28th, 1916: John R. Frankish and Robert Scott. March 13th, 1916: Maurice O. Darby and Samuel Pope. Hon. Maynard Greville; March 21st, 1916.

The following appeared in a supplement to the London Gazette issued on the 23rd inst. :—

Supplementary to Regular Corps.—Captain William H. T. Rampling-Rose relinquishes his commission on appointment to the Royal Naval Volunteer Reserve; March 4th, 1916.

Second Lieutenants (on probation) confirmed in their rank: George G. Fiddes, Stuart S. Kennedy and Charles Lambert.

The following appeared in the London Gazette of the 24th inst. :—

Memoranda.—Sergt. Cecil C. Hann, from Royal Flying Corps, to be temporary Second Lieutenant for duty with Royal Flying Corps; Feb. 17th, 1916.

W. A. N. Davies to be Temporary Second Lieutenant, but without Army pay or allowances whilst undergoing a course of instruction; March 21st, 1916.

Supplementary to Regular Corps.—C. W. C. Wheatley, from Captain, Unattached List (T.F.), O.T.C., to be Captain; March 25th, 1916.

Robert C. M. Smith to be Second Lieutenant (on probation); March 7th, 1916.

The following appeared in a supplement to the London Gazette issued on the 25th inst. :—

Flight-Commanders from Flying Officers (and to be Temporary Captains whilst so Employed).—Lieut. F. W. Goodden, Special Reserve; Feb. 15th, 1916. Lieut. G. Wenden, Border Regt.; Feb. 23rd, 1916. Lieut. W. H. Furlonger, Special Reserve, from a Balloon Officer, and to be Temporary Captain whilst so employed; Feb. 24th, 1916.

Flying Officer.—Second Lieut. J. D. Latta, Special Reserve; Feb. 24th, 1916.

Balloon Officers.—Temporary Lieut. N. J. A. L. Prinsep, Royal Scots Fusiliers, and to be transferred to the General List; Feb. 10th, 1916. Second Lieut. F. C. E. Liardet, Devonshire Regt. (T.F.); Feb. 28th, 1916. Second Lieut. B. H. Sisson, R.G.A., Special Reserve; March 10th, 1916.

Wing-Adjutant.—Lieut. Dawyck M. V. Veitch, 1st Duke of York's Own Lancers (Skinner's Horse), Indian Army, and to be Temporary Captain whilst so employed, vice-Temporary Capt. C. F. Lee, West Somerset Yeomanry (T.F.), from Dec. 20th, 1915, to Feb. 24th, 1916, substituted for the notification which appeared in the Gazette of March 7th, 1916.

Assistant Equipment Officers.—Temporary Lieut. H. A. P.

Disney, Cambridgeshire Regt. (T.F.), from a Flying Officer; Feb. 1st, 1916. Second Lieut. V. P. Spurway, Special Reserve; Feb. 29th, 1916.

Memoranda.—To be Temporary Second Lieutenants: Acting Sergt.-Maj. James Robertson Grant, Royal Flying Corps, for duty with the Military Wing of that Corps; March 11th, 1916. Pte. Henry O. W. Hill, from Manchester University O.T.C., for duty with the Royal Flying Corps; March 19th, 1916.

Supplementary to Regular Corps.—Second Lieutenant (on probation) Hywel I. Hughes is confirmed in his rank.

To be Second Lieutenants (on probation): William H. Smith; Jan. 28th, 1916. Laurence C. Angstrom; Feb. 20th, 1916. Patrick R. Stirling; March 20th, 1916.

THE following appeared in a supplement to the *London Gazette* issued on the 27th inst. :—

Squadron-Commanders from Flight-Commanders.—March 1st, 1916: Major B. F. Vernon-Harcourt, Welsh Regt.; Major T. C. R. Higgins, King's Own (Royal Lancaster Regt.). And to be temporary Majors whilst so employed: Capt. A. C. Boddam-Whetham, Princess Louise's (Argyll and Sutherland Highlanders), Special Reserve; Lieut. (Temporary Capt.) W. R. Read, 1st (King's) Dragoon Guards; Capt. W. G. S. Mitchell, Highland L.I.; Lieut. (Temporary Capt.) G. J. Malcolm, R.A.; Capt. W. H. C. Mansfield, D.S.O., King's (Shropshire L.I.); Lieut. (Temporary Capt.) A. S. Barratt, R.A.

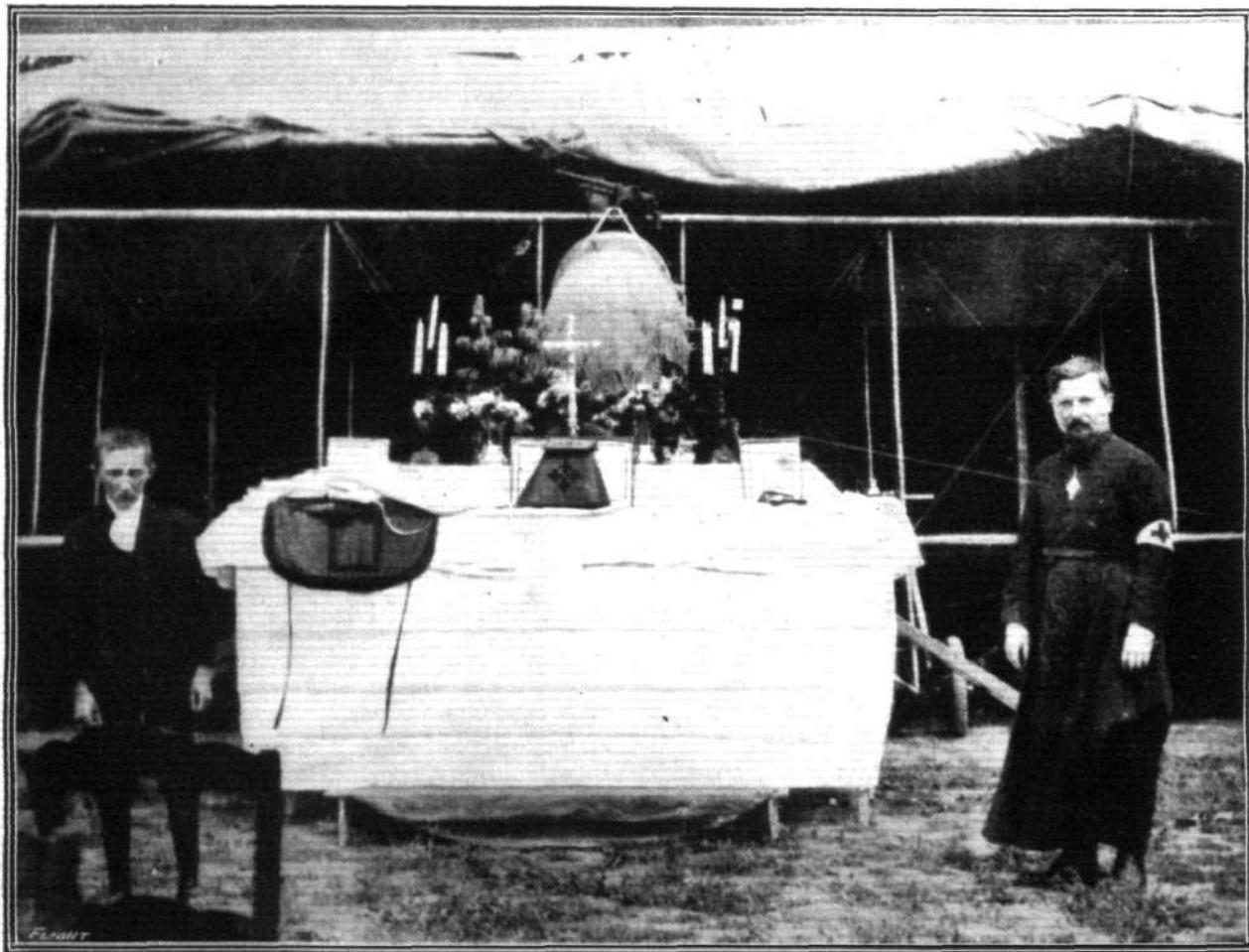
Flight-Commanders (from Flying Officers).—March 1st, 1916: Temporary Capt. the Right Hon. A. T. Lord Lucas, Hampshire (Carabiniers) Yeomanry (T.F.); Capt. H. J. Collins, Hampshire Regt., Special Reserve. And to be Temporary Captains whilst so employed: Lieut. G. R. Elliott, 3rd (Prince of Wales's) Dragoon Guards; Lieut. L. F. Richard, R.A.; Lieut. G. G. A. Williams, 5th (Princess Charlotte of Wales's) Dragoon Guards, Special Reserve; Temporary Lieut. A. E. G. MacCallum, General List; Lieut. D. M. King, Reserve of Officers; Lieut. G. Allen, Connaught Rangers; Lieut. J. V. Steel, R.A.; Lieut. L. W. F. Turner, Special Reserve; Lieut. R. A. Archer, R.A.; Lieut. G. A. Turton, Alexandra, Princess of Wales's Own (Yorkshire Regt.); Lieut. F.

Dunn, Special Reserve. March 8th, 1916: Sec. Lieut. A. R. Tillie, Cameronians (Scottish Rifles) (T.F.); Sec. Lieut. W. G. B. Williams, Special Reserve. Temporary Capt. A. H. Jackson, Sherwood Foresters (Nottinghamshire and Derbyshire Regt.); March 14th, 1916.

Equipment Officers, from Assistant Equipment Officers, and to be Temporary Captains whilst so employed.—Temporary Lieut. A. C. S. Couldwell, General List; Feb. 6th, 1916. Lieut. L. M. Bennett, Special Reserve; Feb. 9th, 1916.

Flying Officers.—That part of the notification in the *Gazette* of Nov. 12th, 1915, transferring Temporary Second Lieut. R. L. Johnston to the General List is cancelled. Temporary Second Lieut. H. P. Lowe, General List; Feb. 10th, 1916. Lieut. H. V. Acland, 3rd Canadian Pioneer Batt.; March 1st, 1916. March 7th, 1916: Lieut. J. K. Law, the Royal Fusiliers (City of London Regt.), Special Reserve, and to be seconded. Temporary Lieut. J. R. Burns, the Cameronians (Scottish Rifles) (T.F.). Second Lieut. K. Mathewson, Special Reserve. Second Lieut. C. W. P. May, the Royal Irish Rifles, Special Reserve, and to be seconded. Temporary Second Lieut. A. L. Findlay, General List, from a Flying Officer (Observer).

Assistant Equipment Officers.—Second Lieut. F. Murphy, Special Reserve; Feb. 2nd, 1916. Second Lieut. E. B. Horlick, Special Reserve; March 1st, 1916. March 7th, 1916: Sec. Lieut. S. S. Dixon, Special Reserve; Temporary Second Lieut. T. G. Gordon, General List, Temporary Capt. W. Wade, Duke of Cambridge's Own (Middlesex Regt.), and to be transferred to the General List; Second Lieut. S. S. Kennedy, Special Reserve; Second Lieut. C. Lambert, Special Reserve; Temporary Second Lieut. A. E. Neale, General List; Second Lieut. G. G. Fiddes, Special Reserve; Temporary Second Lieut. E. R. Moxey, General List; Second Lieut. J. M. Patten, Special Reserve. March 8th, 1916: Temporary Second Lieut. J. Inwood; Second Lieut. W. H. Smith, Special Reserve. March 11th, 1916: Second Lieut. B. M. Iles, Special Reserve; Temporary Lieut. G. J. Monson-Fitzjohn, Border Regt. (T.F.). Second Lieut. H. I. Hughes, Special Reserve; March 15th, 1916.



WITH THE FRENCH ARMY.—A unique altar. The French priest at the front can always easily adapt himself to circumstances, as may be seen in the above photograph. The priest has arranged his altar on a French biplane, for the loss of being able to find a better support.

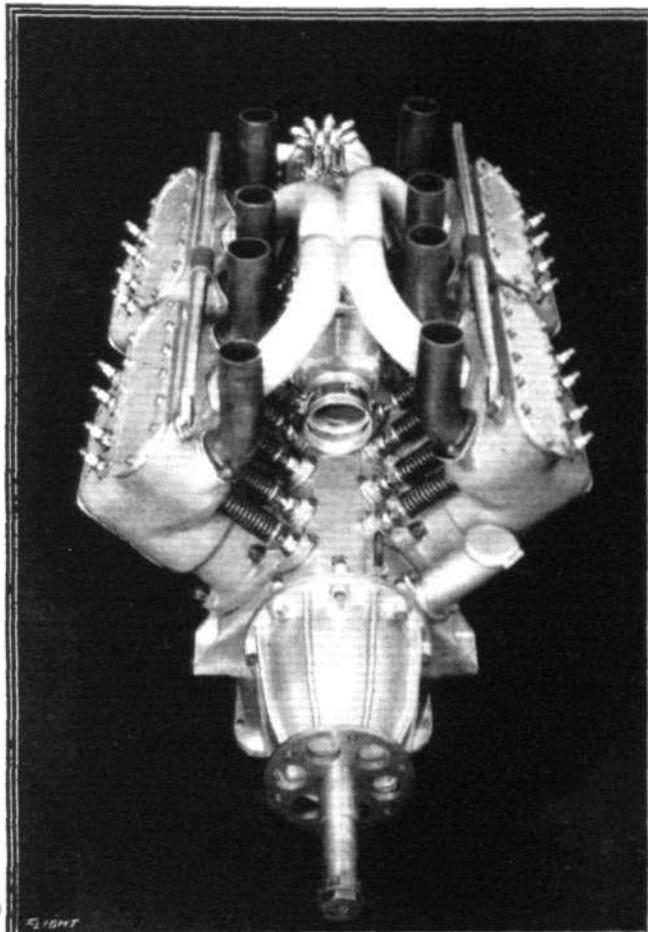
THE 135 H.P. THOMAS AEROMOTOR.

In producing what is known as the Model 8 Aeromotor, the main objectives of the Thomas Aeromotor Co., of Ithaca, N.Y., U.S.A., have been reliability, brake horse-power developed, and rate of production. By a judicious selection of materials, and an efficient combination of system and the use of up-to-date tools, it has been possible to achieve not only these desirable qualities, but also to secure that the various parts are interchangeable—a point of considerable importance at all times.

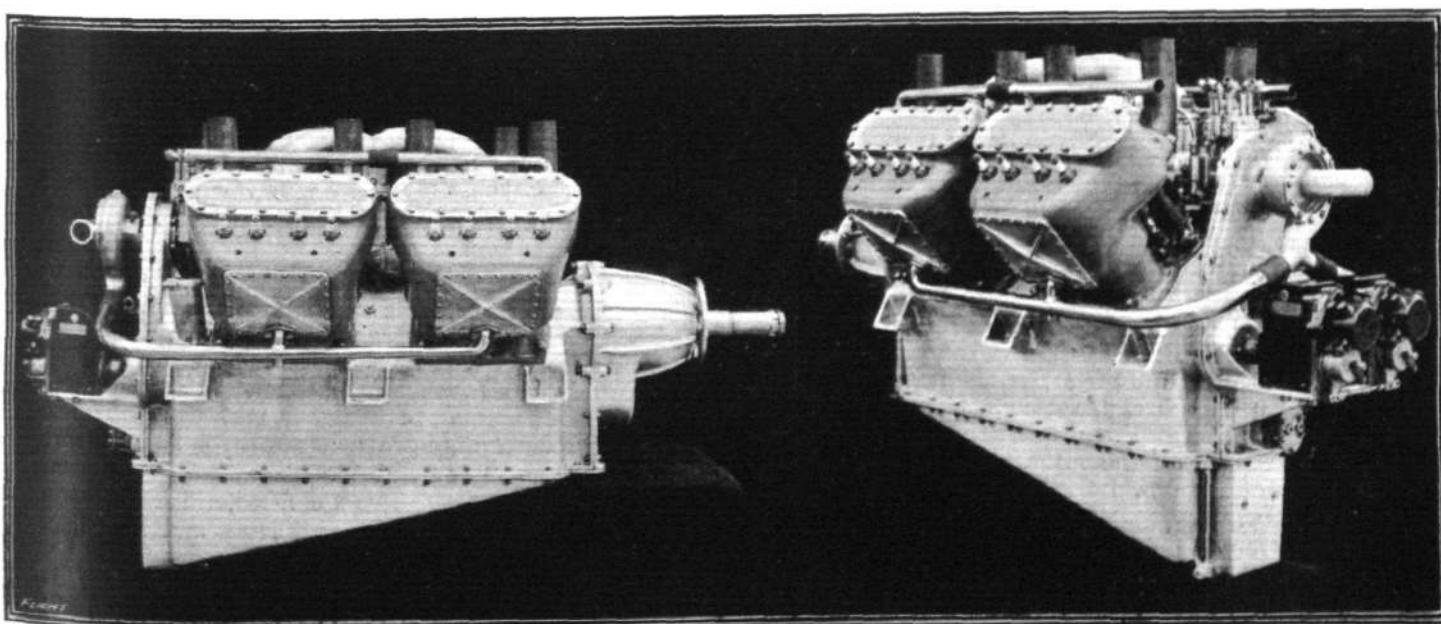
One of the principal features of this motor, which is of the 8-cylinder V water-cooled type, is that the propeller or tractor screw is driven through a reduction gear, the speed of the latter being 1,200 r.p.m. and that of the engine 2,000 r.p.m., at which speed a brake horse-power at the propeller shaft of 135 is guaranteed. The cylinders of 4 ins. bore and $5\frac{1}{2}$ ins. stroke are of the "L" head type, cast in pairs from a special, hard, close-grained iron, the water jackets being cast integral and providing ample space around all parts of the cylinder, including the valve caps, which are easily reached by the removal of an aluminium cover plate. Each pair of cylinders is held down on to the crankcase by six studs located close to the cylinder walls.

Made of Tungsten steel, the valves are in one piece without welding, and give a clear opening of $2\frac{1}{8}$ ins.; the valve springs are made of a special alloy steel in order to stand up under the most severe conditions of continuous service. The valve push rods, which pass through guides held in the cylinder-base flanges, are made of hardened tool steel, and are operated directly by the cams without intervening cam rockers. Means is provided whereby the tappet clearances may readily be adjusted, and great care has been taken to prevent oil leakage at the push rods. The camshaft is located in the crankcase between the two banks of cylinders, and the sixteen cams are formed integral with the shaft, hardened and ground to size. Drilled for lightness, the shaft itself is of large proportions, thereby insuring rigidity and long life to its three phosphor-bronze bearings, which are lubricated by high pressure force feed directly from the main oil duct. A flange to receive the

timing gear is formed on the driven end of the camshaft. The timing gears have spur cut teeth, and are made of chrome nickel steel, heat treated. Lubrication of the gears is effected by overflow of oil through the pressure regulating relief valve, which is situated adjacent to the



An end view of the Model 8 Thomas aeromotor, showing the propeller reduction gearbox.



Two side views of the Model 8 Thomas aeromotor.

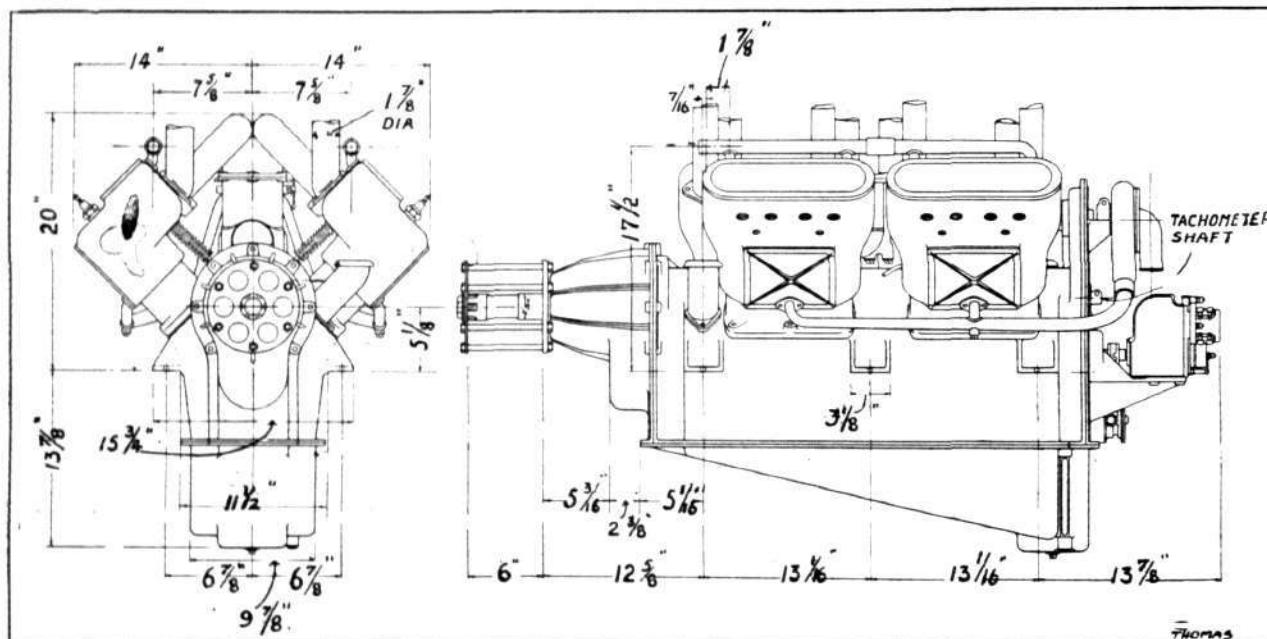
timing gears at the end of the high pressure main oil duct.

Special chrome nickel steel is also used for the four-throw crankshaft, which is carried on three bearings of liberal length, whilst the journals and crank pins are of large diameter, drilled for lightness and plugged for the high pressure force feed lubrication; the crank webs also being drilled and plugged to lead oil to the connecting rod big ends. The connecting rods, made from chrome nickel steel heat-treated, having a very high elastic limit, are of H section, arranged side by side on the same crank pin for opposite cylinders, and in order to secure light weight and uniform balance are machined all over. The big ends are lined with babbitt metal, which is applied directly to the rods, forming an integral part thereof. The hollow chrome nickel steel gudgeon pins are pack hardened and ground to size and locked in the connecting rods. The pistons are of a special aluminium alloy with well ribbed heads for strength and cooling. Two concentric lap jointed compression rings, located near the piston head, are employed.

Cast in an aluminium alloy, the crankcase is well ribbed to give strength and rigidity. It is divided into two parts,

A single centrifugal pump, driven at engine speed off the camshaft timing gear wheel, circulates the cooling water, equally distributing it to both banks of cylinders by means of a double-branched outlet from the pump to the brass water pipes at the base of the cylinder jackets. The water outlets are located over each exhaust valve, and all connections are kept close to the cylinders for rigidity and economy of space. Only four hose connections are necessary.

A Zenith double vertical carburettor is employed, bolted to a water-jacketed cast aluminium double branch pipe serving the two banks of cylinders. All the bends are of large radii, and a hot-air intake is fitted to the carburettor. Two Splitdorf "Dixie 8o" magnetos are used, each constituting an entirely independent ignition system with two sparks per cylinder. They are arranged side by side, and are driven by spur gearing from the crank-shaft at the same speed as the latter. The plugs are located in the cylinder heads over the pistons. The propeller is mounted on a short shaft driven from the crankshaft through two spur gears of special chrome nickel gear steel, heat treated, and is supported by two large ball bearings housed in a well ribbed aluminium



Line drawings of the Model 8 Thomas aeromotor, giving the principal dimensions.

the lower half serving as an oil sump, with a capacity of $4\frac{1}{2}$ gallons. A high pressure system of lubrication is employed, a gear pump, located in the crankcase and driven from the crankshaft timing gear, drawing oil from the sump and delivering it to the main oil duct in the crankcase. Thence the oil is forced through holes drilled in the main bearing supporting webs to the crank-shaft and camshaft bearings, and connecting-rod big ends. The latter receive oil through the drilled crankshaft webs and crank pins. The gudgeon pins, pistons, cams and push rods are lubricated by the oil thrown off the crank pins. To keep it cool the oil is taken from the sump, above the two-gallon level, by a separate gear pump and passed through coils, and returned to the sump. It is possible to arrange a sight gauge in the circuit, so as to warn the pilot when the two-gallon level has been reached; this should prove valuable in the case of long flights, warning the pilot when to add oil to the sump from the auxiliary tank.

case bolted to the crankcase. Both the ball bearings are of the annular type, the outer one having a two row ball race for taking the combined radial load and thrust from the propeller in both directions.

A Christensen self-starter, weighing complete approximately 40 lbs., is fitted as standard. This self-starter, which is of the combined petrol and air type, is composed of four principal parts:—a small air compressor, an automatic distributor, a surface carburettor, and a compressed air reservoir. The air compressor and the distributor are located between the two banks of cylinders, and are driven off the water pump gear-shaft. A petrol gear pump and a tachometer drive are fitted, whilst provision is also made for driving wireless and stabiliser apparatus.

The complete weight of this model 8 motor is 600 lbs., or 4·4 lbs. per h.p. The petrol and oil consumption is 14 galls. per hour and 1 gall. per hour respectively.

ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS.

ANNUAL GENERAL MEETING.

The Annual General Meeting of the Royal Aero Club was held on Tuesday last, the 28th inst., at 166, Piccadilly, London, W. Professor A. K. Huntington, Vice-Chairman, presided, and there were about 40 Members present.

Professor Huntington, in opening the Meeting, reviewed the work of the year, and said that from the accounts for 1915 which had been passed by Aero Proprietary Limited at its Annual General Meeting that afternoon, it could be seen that the Club's finances were very satisfactory. In spite of the War, the Club had been more successful than in any previous year.

A large number of Aviators' Certificates had been granted by the Club during the year.

The following British Record had been made during 1915:—
Height—Pilot alone:—

H. G. Hawker, at Hendon, 6th June, 1915, on a Sopwith Biplane, 80 h.p. Gnome Engine, 18,393 feet.

The Subscriptions to the Flying Services Fund, which was being administered by the Club for the benefit of Officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependents of those who are killed, amounted to £10,591 8s. 3d., the total of the Subscriptions at the end of 1915 being £10,125 13s. 8d. A number of grants and allowances had been made from the Fund, and the Accounts had been audited up to the end of 1915.

The number of Members who had died on active service was 55. A great loss to the Club had been the death of Lieut.-Col. J. D. B. Fulton, C.B., who was a Member of the Committee.

In spite of these losses, the Membership had been maintained and for some time had been increasing.

In September last, the hours of opening the Club had been extended to 10.30 p.m. each day, including Sunday, and it was found that this extension had been much appreciated by the Members.

On account of the progress of aviation and the Club being used more now than heretofore, the question of acquiring a Club House had been raised, but the general opinion was that it was not wise at the present time to make a move in this direction. The House Committee was however going into the question of suggesting further developments to The Committee.

He thought that there was no need to refer in detail to the good work of the Flying Services in the War, as this was only too well known to the Members. A large number of honours had been gained, including 6 V.C.'s, 38 D.S.O.'s, 8 Distinguished Service Crosses and 48 Military Crosses. It was gratifying to note that many of these honours had been gained by Members who took a great interest in the Club, and in this connection he would like to mention amongst others:—Commander C. R. Samson, R.N., Wing Com. R. B. Davies, R.N., Squad.-Com. Spenser D. A. Grey, R.N., Squad.-Com. R. L. G. Marix, R.N., Squad.-Com. E. F. Briggs, R.N., Squad.-Com. J. T. Babington, R.N., Squad.-Com. A. W. Biggsworth, R.N., Flight-Com. S. V. Sippe, R.N., Capt. Robert Loraine and the late Lieut. W. B. Rhodes-Moorhouse.

The Club Flying Ground had been occupied by the Admiralty since December, 1914, and was being used entirely as a Naval Air Station, and the Committee were very glad that the Club had been able to be of assistance to the Country in this way.

Everyone would agree that the achievements in aviation had been remarkable in so short a time, and it was a matter for congratulation that the Club, as a technical Club, had done so well in its development.

A discussion followed on the question of extending the premises of the Club, in which the following took part:—Com. C. R. Samson, R.N., Capt. Loftus A. Bryan, Mr. P. Maréchal, Mr. Henry Knox, Mr. C. G. Greenhill, Mr. R. Haden Tebb, and Mr. R. W. B. Billinghurst.

Vote of Thanks to Chairman.—On the motion of Flight Com-

mander C. F. Pollock, seconded by Capt. C. H. Saunders, a unanimous vote of thanks was passed to the Chairman.

Election of Vice-President and Council.—On the motion of the Chairman, the Vice-President and Council for the ensuing year were unanimously elected as follows:—

Vice-President.

The Rt. Hon. Lord Northcliffe.

Council.

S.A.I. Prince Roland Bonaparte (President F.A.I.).

The Rt. Hon. The Earl of Hardwicke.

The Rt. Hon. The Earl of Lonsdale.

The Rt. Hon. Lord Howard de Walden.

The Rt. Hon. Lord Kinnaird, F.R.G.S.

The Rt. Hon. Lord Montagu of Beaulieu.

Admiral of the Fleet the Rt. Hon. Sir Edward Seymour, P.C., G.C.B., O.M., G.C.V.O.

Admiral the Hon. Sir Edmund Fremantle, G.C.B., C.M.G.

Count Henry de La Vaulx (Vice-President Aero Club de France).

Sir David Salomons, Bart.

Sir Norman Lockyer, K.C.B., F.R.S.

Professor Sir William Crookes, O.M. (President Royal Society).

Sir Hiram S. Maxim.

The Rt. Rev. Bishop Welldon.

Martin Dale.

Henry Deutsch de la Meurthe (President Aero Club de France).

Election of Committee.—The election of the following Members to the Committee was announced:—

Lieut.-Col. R. K. Bagnall-Wild, R.E.

Lieut.-Col. W. D. Beatty, R.E.

G. B. Cockburn.

Lieut.-Col. F. Lindsay Lloyd.

Capt. J. T. C. Moore-Brabazon, R.F.C.

Com. C. R. Samson, R.N., D.S.O.

A. Mortimer Singer.

T. O. M. Sopwith.

The Marquess of Tullibardine, M.V.O., D.S.O., M.P.

Revised Rules of the Club.—On the motion of the Chairman, the revised Rules of the Club were approved and confirmed.

Extension of the Hours of Opening the Club.

The Club is now open from 9 a.m. to 10.30 p.m. each day, including Sunday.

THE FLYING SERVICES FUND administered by

THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions. £ s. d.

Total subscriptions received to March 22nd, 1916 10,591 8 3

Collected at the Westland Aircraft Works,

Yeovil (Twenty-sixth contribution) 0 11 3

Total, March 22nd, 1916 10,591 19 6

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

FLYING GROUNDS.

Beatty School.—The following pupils were out during last week: Messrs. Lindsay, Collier, Edwards, Liu, Monhom, Chang, Nan, Jones, Martin, Knox, Hungwan, Phillips, Smith, Stanley, Tjaarda, Brewerton, Tow, Whitmore, Earl, Skeet, Cuthbert, Yam, Ching and Ping.

The instructors were Messrs. G. W. Beatty, W. Roche-Kelly, G. Virgilio, R. W. Kenworthy, L. L. King, A. E. Mitchell and H. Fawcett, the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron dual-control and single-seater tractor biplanes. Extra practice was taken by Mr. H. Lewis.

FROM THE BRITISH

London Aerodrome, Colindale Avenue, Hendon.

Grahame-White School (R.N.A.S.).—Circuits with instructor last week: Probationary Flight Sub-Lieuts. Donald and Melhado. Brevet test C: Probationary Flight Sub-Lieut. Wigglesworth.

Grahame-White Civilian School.—Circuits with instructor: Messrs. Holman, Rigby, and Tanner. Eights with instructor: Messrs. Baragar, Butler, Eichelbrenner, Hathaway, Leigh, Sandys, and Williams. Eights alone: Mons. Grasset. Instructors: Messrs. Biard, Hale, Manton, Pashley, Russell and Winter.

Hall School.—The following pupils were out receiving instruction last week:—

Pupils rolling: Messrs. Halliday, Dickson, Glegg, Warwick, Osmond, Rayne, Le Grice, Collier, Hucklesby and Duncan. With A. Chave: Messrs. Longton, Cosgrave, Mahoney, Chapman, Rochford, Neal, Halliday and Smith, all making good progress. With H. Stevens: Messrs. Ormerod, Arnsby, and Lieut. Cooke. With C. M. Hill: Messrs. Osmond and Taylor.

Hall and Caudron Government-type tractors in use.

London and Provincial Aviation Co.—Pupils doing rolling last week: Messrs. Jennings, Garnett, Quayle, and Ferris. Doing straights: Messrs. Archer, Creaghan, Houba, Rimer, Verbessem, de Goussencourt, Moore, Dawson, Aldous, and Starey. Circuits and half-circuits: Messrs. Vilain XIII, and Brown.

Instructors: Messrs. W. T. Warren, M. G. Smiles, H. Sykes, and W. T. Warren, jun. Mr. A. Brown took an exceptionally good Royal Aero Club "ticket."

Ruffy - Baumann Schcol.—Pupils at work with instructor last week: Messrs. Dobson, Edgar, Portela, Winter, Hoskyns, Torres, Maya, Cuthbertson, Westlake, Williams, and Williams, Capt. Bailey and J. B. Thomas, jun. Straights or rolling alone: Messrs. Portela, Maya, Torres, Cox, Wood, Muspratt and D'Opstael. Eights or circuits: Baron D'Opstael.

Instructors: Messrs. Ed. Baumann, Felix Ruffy, Ami Baumann, Clarence Winchester and Andre Thomsen.

50 and 60 h.p. Ruffy-Baumann tractor biplanes in use. **Bournemouth School.**

Pupils doing rolling last week: Messrs. J. Wilson, G. Mouton, Morris, Adamson, and Kennedy. Straights alone: Messrs. Smith, O. Wilson, Morley and W. Mouton. Half circuits and circuits alone: Messrs. Simpson, Dubois, Meeus, and Devos. Figures of eight: Bonnevie.

Instructors for the week: Messrs. F. King, J. G. Woodley, and S. Summerfield. Three Caudrons in use.

Very little practice during week owing to the weather.



A group of pilots who have recently obtained their Royal Aero Club certificates at the Beatty School, Hendon.—1. Lieut. R. E. Symington. 2. E. Williams. 3. C. R. Young. 4. C. G. Baldwin. 5. S. Willmett. 6. E. L. Brynildsen. 7. L. E. Owen. 8. F. H. Hodgson. 9. W. H. Whincup. 10. O. C. Godfrey. 11. J. Stampe. (Photos. by F. N. Birkett, with the exception of No. 1 (Swaine)).

AIRSHIPS

By R. P. HEARNE.

The Airship Lake.

I WONDER when we shall have our Airship Lake, bordered by laboratories and factories, and with the secluded and sheltered waterway as testing place for our ships of the air? It looks a far-off affair, and yet it must come. After this war we shall have to meet German competition and German preparation again in some form or other, and it is only by our scientific and technical progress that we can keep prepared. After one sound beating Germany will be cautious about tackling us again, *provided that we maintain strength and preparedness*. Grow slack, and she will plot again.

It is certain that the great problem of aerial supremacy must be worked out on a grand scale in which no branch of aeronautics can be neglected. Hence, the airship in every practical form will call for much attention. Once this is recognised—and we only require a broad-minded Air Ministry to discover it—we shall see a new industry springing up for the manufacture of airships. The Airship Lake will then be a necessity.

The value of Lake Constance to Count Zeppelin cannot be over-estimated. With his very first ship, launched sixteen years ago, he was able to score a success. If the vessel had been tried over land it would assuredly have been wrecked by collision with the earth before the early errors of design, &c., could have been corrected. But the lake surface provided a buffer and flotation medium which saved the ship from destruction. Incidentally it also suggested the idea of the naval Zeppelin in later years. Had Zeppelins not been built and tested over water we would probably have had no raids upon England in this war, nor would the German fleet have had the service of naval Zeppelins. The orthodox airship pilot fought shy of oversea work, mainly because his ship was evolved and tried out over land.

When we have a well founded and well supported industry for building the necessary airships for the country's requirements we must of necessity have our Airship Lake, or other sheltered waterway. Then we can promise developments which will keep us level, or ahead of, all other rivals. Some people will ask if the result can be worth the cost. But in war one cannot strike a balance in that way. If the enemy has any weapon which enables him to hurt you, or which enables him to buoy up his own people with the idea that this weapon does hurt you, then it is most advisable that the advantage conferred by that weapon be neutralised.

Zeppelin Fleet Growing Stronger.

Many specialists have been called in to deal with the Zeppelin menace to England, and also with the Zeppelin advantage to the German navy for scouting purposes. Every remedy has been tried save the most logical one of meeting Zeppelin with Zeppelin. As matters stand now, the Zeppelin fleet resembles the British fleet in that both are stronger and better than at any other period of the war. Just as the Germans have vainly nibbled at our fleet with submarines and mines, so we have nibbled at the Zeppelin fleet with gun defences and

spasmodic aeroplane raids. We must disregard the silly rumours that Zeppelins exist by the hundred, and that new ones are turned out daily. But the fact remains that the Zeppelin fleet is steadily growing stronger.

Annihilating the Airships.

There is one little point which aeroplane enthusiasts overlook when they speak of annihilating the Zeppelins in their sheds. Where are these sheds? How many new sheds may not Germany have built since she shut out or shut up foreigners in 1914? Indeed, many of the pre-war Zeppelin harbours were so deep in the heart of Germany that they are unreachable by military aeroplanes in war trim. And what daring air raider will seek to destroy the subterranean Zeppelin sheds on Heligoland?

By all means let us try mightily to destroy the Zeppelin bases which come within reach, especially those temporary harbours in Belgium, but do not let us raise false hopes that all Germany can be scoured by our aeroplanes and every Zeppelin eliminated by that means. It would be another story if we had super-Zeppelins of our own, which at once could cruise along our coast and destroy any raiders by superior gun power and superior speed.

Should We Call Them Zeppelins?

By the by, I sometimes take myself to task for calling rigid airships "Zeppelins," and so leading on to the phrase "super-Zeppelin." But what is one to do? The public will have no other word. In the early stages of the war the descriptive reporters used to call aeroplanes Zeppelins. If Germany had not broken the peace Count Zeppelin would one day have come to be universally honoured as the originator of the rigid airship. And although he has turned out to be a nasty and murderous kind of old thug, we cannot dissociate his name from a great invention which he has used to base ends. However, let us get our super-Zeppelins, and make his ships a back number.

No Improvement!

A rather mischievous statement has appeared in the *Observer*, to the effect that Zeppelins to-day can do no more than was feasible for them eighteen months ago. This is as foolish as to say that the military aeroplanes of August, 1914, were as good as the latest machines. No one in this country can tell what improvements the Zeppelin engineers have made during the war period, nor can any one declare that they have stood still. Not even our authorities have sufficient comparative data to go upon.

But we know that war is a tremendous stimulant to the improvement of war material. We know also that aerial motors have developed very rapidly under this stimulus, and we can only conclude that if Zeppelins get the improved engines of to-day they must have greater power, greater speed, more reliability and a wider range of action. The engine is the very heart of every aerial vehicle, and engine improvement confers new powers on the vessel. It also leads to further improvement in the vessel itself.

Thus to circulate the idea that Germany is not making

progress with her Zeppelins is as mischievous as it is erroneous. It is calculated to make us slacken our efforts, and sink into the old policy of "Oh, let it be.—The Zeppelin is no good. It has done its worst to us. Let's go to sleep again!"

I sometimes wonder how some of these good people who deride the Zeppelin menace would think if a bomb injured them? We can be very callous to the sufferings



THE LATEST GERMAN ZEPPELINS.

In our issues of February 12th and 19th, of 1915, we published a highly interesting article on the Zeppelin question by the well-known French writer on aeronautical matters Mons. Georges Prade. Mons. Prade, who has had an opportunity of examining the wreck of the L.Z. 77 brought down at Révigny, has now given his further views and deductions based on this examination in an article appearing in the *Times* of March 25th. After pointing out the incorrectness of the sensational reports of super-Zeppelins 400 yards long, Mons. Prade proceeds to examine whether it is reasonable to suppose that the airship brought down at Révigny was one of the latest type.

"The question may," the writer asserts, "be answered in the affirmative. It included, as will be seen later, new contrivances; it had five motors and five propellers, and a larger cubic capacity. Finally, it bore the number L.Z. 77. The letters L.Z., followed by a figure, indicate the order of delivery from the Zeppelin yards. In July, 1914, on the eve of the war, the dirigibles L.Z. 24 and L.Z. 25 were received from the Zeppelin works at Friedrichshafen. L.Z. 30 carried out her trials on the Bodensee on November 5th, 1914, in my presence. The figures L.Z. 77 suffice alone to indicate that Germany has constructed since the war, in 18 months, at least 52 Zeppelins. In the last quarter of 1914 she launched one every three weeks. To day, as the above estimate shows, she completes at least one every 10 days. If, therefore, the L.Z. 77 were one of an old type, Germany would have attained an output of more than one Zeppelin a week. It is, besides, only logical to assume that Germany employed to aid her offensive on Verdun—in which the dirigible co-operated by trying to cut the railway line which supplies the great fortress—the most recent and most redoubtable type in her aerial fleet.

"We may, therefore, take the L.Z. 77 as the basis of an examination of the airships which have flown over England and Paris, and may do so again.

"In presence of the shapeless heap of débris—broken aluminium girders, twisted and blackened by the fire—it was not possible to reconstruct exactly the dimensions of the Zeppelin that had been brought down. But an examination of the main beams, their curve, the estimated stress limit—which was compared with the materials of the Z VIII, brought down in France in August, 1914, and which was of 22,000 cubic metres capacity—warranted the conclusion that the L.Z. 77 measured about 30,000 cubic metres. The metal employed was somewhat different—aluminium, toughened by a slight alloy of copper and zinc.

"The following are the dimensions of previous types:—

	Cubic metres.	Length. Metres.	Diameter. Metres.
Type 1912	19,500	141	14·80
Type 1913	22,000	156	14·80
Type 1914	27,000	158	16·58
Type 1915	30,000	which should give a length of about 160 metres.	

"The shape is no longer the same. All previous Zeppelins were symmetrical—that is to say, both ends were alike. The L.Z. 77, like British and French airships, was much bulkier forward and tapered off towards the stern, which gave her, with an equal capacity, less resistance when advancing, and, consequently, with equal power, greater speed."

This statement is highly interesting in showing that the designers are no longer adhering to their original practice of keeping the sides of the airship parallel. One of the features of the "Schütte-Lanz" airships was, it may be remembered, that they were of a much better stream-line form than the Zeppelins. When they failed to make good it was probably more on account of their wood construction than their shape, and it would therefore appear that the Zeppelin works have combined, in their latest types, the stream-line form of the "Schütte-Lanz" with the aluminium construction of the Zeppelins.

"There were," continues M. Prade, "as always, two cars, which the Germans call 'gondolas,' a kind of metal boat, in which were placed the motors and the mechanics. They communicated by

means of others until the danger comes near ourselves. It makes me sad to think that a single preventable death should have occurred in this war through neglect on our part. I do not measure the Zeppelin danger in thousands of lives, or make ghastly comparisons of the raids with the "Lusitania" crime. One wasted life should be sufficient to make us redouble our efforts against Germany.



THE LATEST GERMAN ZEPPELINS.

means of a central cabin, in which were stationed the pilots, the crew, and the gunners who throw the bombs. The wireless telegraph apparatus was in the same place as the projectiles. A central ladder led from there vertically through the Zeppelin to the upper part, which was provided with a platform or shield, whence machine-guns could be fired. This ladder passed between two of the 20 independent ballonets, separated by partitions, which in a Zeppelin correspond to the watertight compartments of a ship."

Resuming, M. Prade says: "L.Z. 77 was provided with five motors of the same type as those of previous dirigibles—Maybach motors, of the type known as 180-200 h.p., with six vertical cylinders of 160 x 170, water-cooled, weighing 448 kilogrammes, and consuming about 230 grammes of petrol per horse-hour, and 2 kilogrammes 500 of oil per hour, and per motor. The Maybach factory is situated at Friedrichshafen. The engineer Maybach is the ex-technical director and founder, with Daimler, of the Mercedes factory.

"In the 1912 and 1913 types there were three of these motors, driving four propellers, placed symmetrically, two on the left and two on the right side of the Zeppelin, a third of the length of the airship, from the bow, and a third from the stern. The rear motor worked two propellers. The type 1914 had four motors and four propellers. In the 1915 types, such as L.Z. 77, there is, in addition, a fifth motor, which drives a fifth propeller placed behind the stern car. In this way an increase of horizontal speed was obtained, and at the same time an increase of ascensional speed, so that the airship, throwing out ballast, inclining its vertical planes and raising its nose to over 15 deg., might rise and escape at full speed. This was the plan followed by the dirigible which came to Paris on January 27th, 1916. After having dropped its bombs it seemed literally to bound upwards towards the sky, and disappeared in the darkness above the airmen, even though they were flying at 2,800 metres.

"The corpses, or rather remains of corpses—for several were entirely carbonised—which were found on the ground pointed to a crew of 23 men. That is about the same estimate as that of the skipper of the trawler 'King Stephen,' of Grimsby, when he met the L. 19, lost at sea, on its way back after cruising over England, and would seem to prove that the airship was of a similar type. The 1912 models could be worked by eight men, those of 1913 by 12 men, and those of 1914 by 18 men. The latter figure is established by the mentions in despatches of the Zeppelins which bombarded Antwerp, Paris, and England at the beginning of 1915, published in the German technical journals.

"The 1914 types carried a thousand kilogrammes of bombs for a raid of about 400 nautical miles. The L.Z. 77 had on board 1,500 kilogrammes of bombs, composed of 20 projectiles, weighing 50, 80, and 100 kilogrammes."

With regard to the method employed for launching the bombs the general public appear to be under the impression that the missiles are thrown overboard by hand. The precise apparatus used for this purpose is described thus by Mons. Prade:—

"Each bomb was placed in a special bomb-thrower formed of a hook which the weight of the bomb opened when the hook was freed by an electric current controlled by a push button in the cabin—an arrangement corresponding to that of a bell, with its electromagnet and soft iron. The crew discharged all the bombs before the Zeppelin reached the ground. They made holes in the soil 7½ ft. deep and 17 ft. in diameter.

"The airship carried no revolver cannon, even of small calibre, but only six machine guns—two on the summit revolving round the shield, two in the forward gondola, and two in the stern gondola.

"It was not possible to determine the exact quantity of petrol carried, the tanks having been melted by the fire. Neither was any trace found of the powerful cold-light searchlights, with which the Zeppelins can illuminate the ground from a great height."

Mons. Prade's remarks below on anti-Zeppelin defences, coming, as they do, from a man who knows what has been done in France, where a much higher efficiency has been attained than here, should be read with the greatest interest:—

"The dirigible was hit while flying at a height of between 1,800 and 2,000 metres. The airship which visited Paris came at about the same altitude, but immediately after rose to more than 3,000 metres by throwing out its ballast and bombs, and climbing with its inclined planes. The airman J. de Lesseps, who chased it for more than 50 minutes, just beneath it, without losing sight of it but unable to hit it, told me he calculated he was from 700 to 800 metres lower than the Zeppelin. His own barometer indicated a height of 2,800 metres, the maximum his gun-plane could reach. It would seem, then, that the best plan, from every point of view, would be to attack the Zeppelins before their arrival over the city, and before they have dropped their projectiles. Above the cities themselves it is better to leave the defence to the anti-Zeppelin guns. Light aeroplanes, climbing high and quickly, can alone attack the monster on his return journey, high up in the air. This gives three phases to the battle:—

"(1) Attack by gun-planes before the arrival of the Zeppelin over London or Paris.

"(2) Attack by anti-Zeppelin guns, fired from the ground while the airship is over the city. If possible, use should be made of guns of fairly large calibre, quick-firing, resembling the 104 mm. and 120 mm. German naval guns, firing at a high angle, with three kinds of shells: 'spotting' shell, leaving a luminous track to discover the Zeppelin and regulate the fire; shattering shell; and shrapnel shell, bursting into innumerable fragments. The 104 mm. anti-aircraft Krupp gun, 45 calibres long, sends a projectile weighing 15½ kilogrammes, with a muzzle velocity of 800 metres, to a height of 4,000 metres, and fires 15 shots a minute. The shrapnel bursts into 625 fragments. These, with the addition of 120 mm. guns, are the ordnance which defend Ostend.

"(3) Light-chasing aeroplanes, armed with machine-guns and incendiary rockets, should attack the airship on the return journey, at a high altitude."

It may be remembered that the opinion has been expressed in these columns that some form of an incendiary rocket might prove more effective for setting a Zeppelin on fire than the projectiles of a



LORD MONTAGU ON

LORD MONTAGU OF BEAULIEU was the guest of the Liberal War Committee at luncheon at the House of Commons, on March 22nd, Sir Frederick Cawley being in the chair.

Lord Montagu said he had come there, not as an irresponsible agitator on aviation matters, but to speak to a serious and well-informed body, the Liberal War Committee, on the need of concentrating special attention and effort on naval and military aviation. The House of Commons was, after all, the holder of the purse with regard to public services, and without the support of the House of Commons no national enterprise could obtain sufficient supplies.

For some years past he had been pleading for a more energetic policy in regard to all forms of aircraft. He had constantly pointed out that we could not afford to neglect the science of aviation, either in a naval or military sense, and the former was at the moment even more important than the latter. The time had now arrived when it was a question whether we could administer such an important service as the Air Service by means of two great Government departments, traditionally competitors and rivals for men, money, and materials. Eventually, he thought, there would have to be concentration of administration in order to secure concentration of effort and policy. He hoped, therefore, that the present Derby Committee would be supported, not only on account of the good work he believed it would do in its present form, but because he was sure that it would be only the forerunner of a Board of Aviation, or a body of that nature, and possibly later a full-blown Ministry.

The powers of the Committee should be enlarged, and should include the handling of all matters dealing with policy, research, design, and supply. The executive control of seaplanes and aeroplanes should be left, as now, in the hands of Sir John Jellicoe and Sir Douglas Haig in their respective spheres.

The struggle for supremacy in the air was only just beginning, and would not stop when peace came, and he asked whether, in view of that eventuality, and the improvements which would be evolved in design and construction, a divided authority could



THE "X" AIRCRAFT RAIDS.

THE following announcement has been officially issued:—

"X 23" Raid. March 19th. "War Office, March 25th.

"Since Sunday last (March 19th) four of the persons who received injuries in the air raid have died, making 13 deaths in all. The total casualties are therefore:—

	Men.	Women.	Children.	Total.
Killed	... 4	3	6	13
Injured	... 16	3	8	27 "

more ordinary character. Mons. Prade appears, from the above statement, to share this opinion. The writer concludes:—

"It is equally indispensable to have a very large number of exceedingly powerful searchlights, placed in a circle round the point to be defended, their rays inter-crossing like an X, so as to catch the Zeppelin as if between the blades of a pair of scissors. It would also be useful to have a certain number of searchlights mounted on aeroplanes, so as to carry the rays nearer the Zeppelin.

"If the bulk of a Zeppelin seems to make it an easy target, its speed and its ability to rise rapidly make it difficult to discover, to approach, and to bring down. It is a difficult task.

"Zeppelins certainly arrive over England at a low altitude, and perhaps even at reduced speed, so as to economise petrol while at sea. They gradually rise, as the weight of petrol diminishes, but they may, on occasions, have been obliged to throw out ballast on reaching the coast line.

"Germany has to-day about 40 Zeppelins, the greater number of which are destined for patrol service over the North Sea and the Baltic, in constant communication with her fleet and her submarines. They thus police the seas and keep a watch on ships of commerce. That is the principal task of Zeppelins.

"From private information which I have received from travellers who went to Germany with a special purpose, I am able to say that the Zeppelin pilots' school is at Leipzig, near the old shed. There are three new sheds and two schools: one for artillery officers (Army dirigibles), and the other for naval officers (marine dirigibles). Leipzig is, as a matter of fact, geographically protected from all incursions of aeroplanes coming from France, Belgium, the sea, or Russia. It is also the centre for making hydrogen (Chemnitz factory), and for airship fittings (Zeiss factory, at Jena). Finally, it stands at the meeting point of three aerial routes which cross Germany, and are indicated by hangars and aerial lighthouses: Route to the Western front, by Leipzig, Gotha, Frankfurt, Mayence, Metz, and France, or by the valley of the Rhine, Cologne, Aix-la-Chapelle, and Belgium; route by the sea, by Cuxhaven, Hamburg, and Kiel, and the hangars of Schleswig; route to the Eastern front, by Berlin, Posen, Liegnitz, Königsberg, to mention only the principal sheds."



THE AIR SERVICES.

concentrate, administer, and prepare. All the great European nations after the war would be impoverished; their armies would be greatly diminished in numbers; and their navies might be seriously damaged or lie at the bottom of the sea. The new form of warfare, which presented the attraction of being cheap, the ability to make war at cost much less than that of warfare on land or sea, would present great attractions to peoples who had been beaten and humiliated, but whose courage and pride still existed. Compared with the cost of Dreadnoughts, field guns, and armies in the field, the cost of even a huge aerial fleet would be small.

As to the discussion which had taken place upon the need of engines of higher power, he was convinced that in aerial development many mistakes must be made. But the nation that was afraid to make mistakes and was frightened of having to scrap afterwards would never progress. Scrapping was always a sign of progress and evolution. We wanted courage to experiment, and build, and fail, and then courage to scrap ruthlessly if the result was not satisfactory.

At the present moment it was true that both Air Services were auxiliary to the Navy and Army, but the day was fast approaching when it would be the principal service of the three, and though this might not come about for some time yet, it was inevitable in the future. What was wanted now among our own statesmen and in our nation was more power of imagination. They could neither win nor hold an empire merely by "safe" policies. "Safe" men were all very well for times of peace. But times came when they might be dangerous. What they wanted now was new men with new ideas. The problems of the air were all new. There were no precedents to bear in mind, no files to refer to, no historical works to consult. The new Service as it would be would need leaders who had ideals, foresight, imagination, and scientific training. Their leaders must always have a clear vision of future possibilities, most of which were probabilities. A saying in the Book of Proverbs aptly fitted the present situation, "Where there is no vision the people perish."



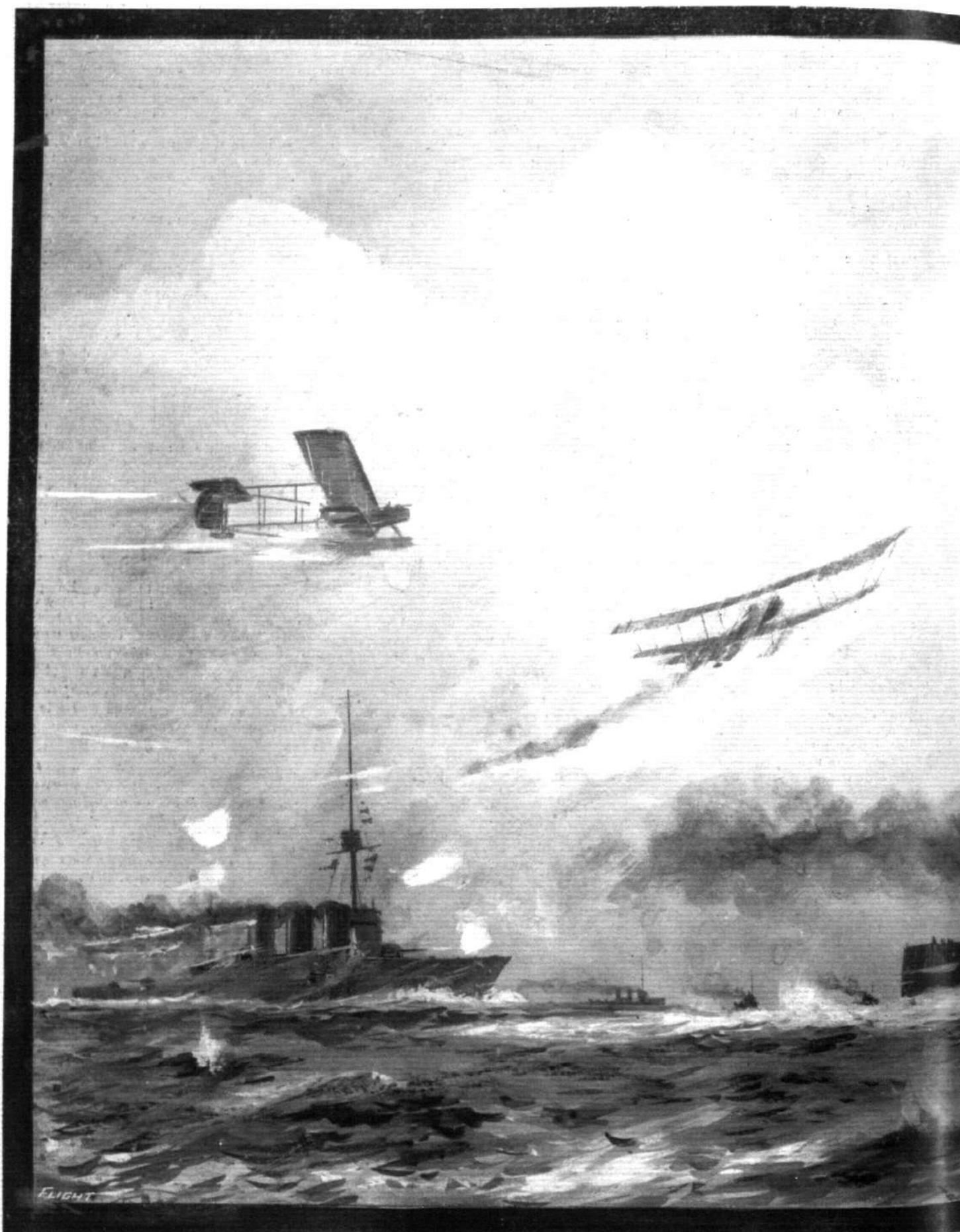
"X 24" Raid. March 19th-20th.

From questions and answers in the House of Commons on March 28th, it appears that six Zeppelins were reported as having been sighted in the neighbourhood of two East Kent and two East Anglian towns on Sunday night, March 19th, or in the early hours of March 20th.

Certain appropriate action was taken in consequence, and aeroplanes went up at certain places.

FLIGHT

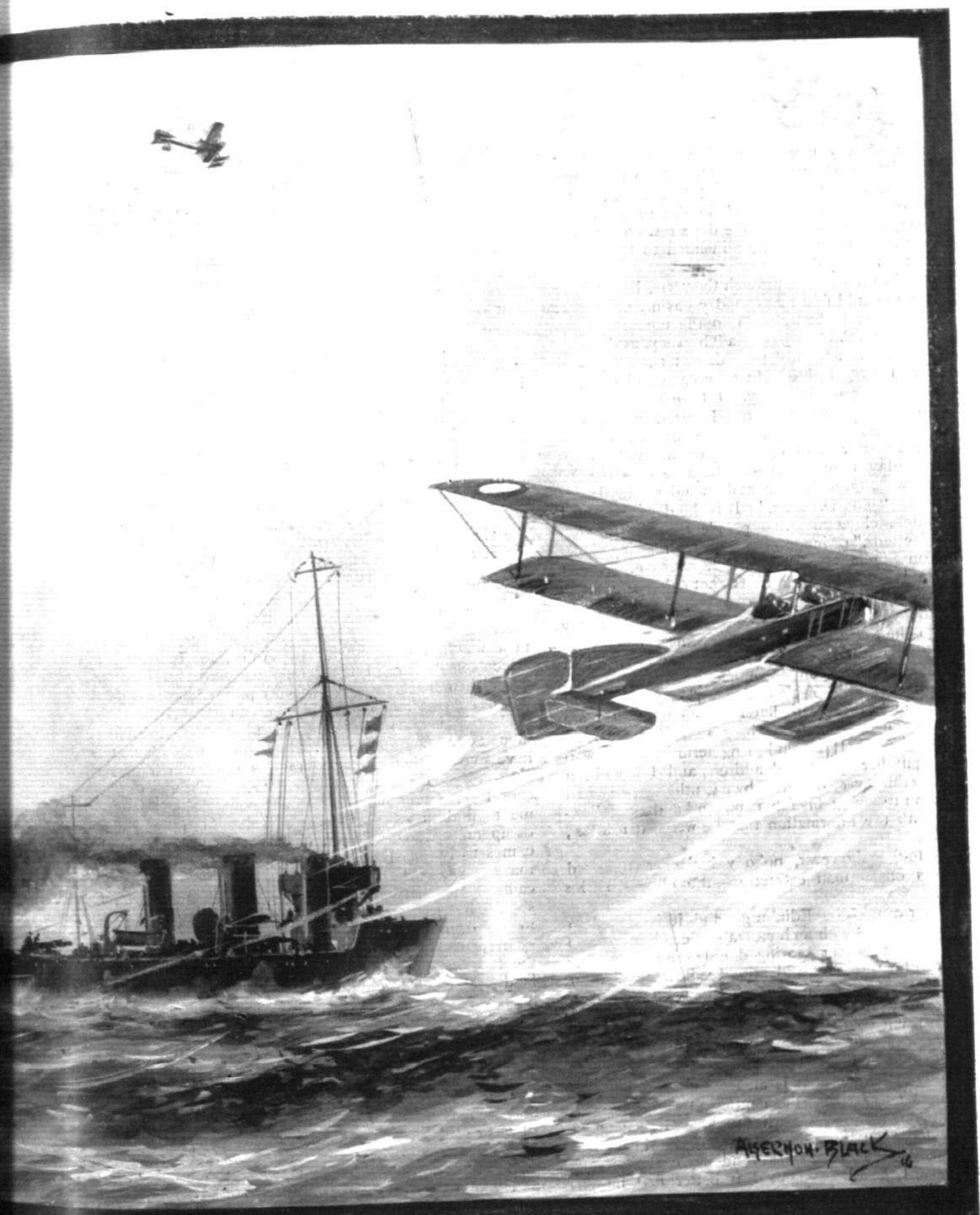
MARCH 30, 1916.



STRIKING AT THE ZEPPELIN IN IT

MARCH 30, 1916.

FLIGHT



The start for the Schleswig-Holstein coast bombardment.

ARMCHAIR REFLECTIONS

by the "Dreamer"

IN the office of any newspaper going to press in mid-week, Monday is always a busy day. I do not mind work; I am a whale for work when I feel like it, therefore I never feel "Mondayfied" in the sense that it generally conveys following on the day's rest on Sunday. Yet on sentimental grounds I am inclined to look upon Monday as my nervy day.

If I cared to trace back through the years, I have little doubt that I should find that Monday was my natal day; it is possible that I shall slide into the unknown on a Monday. Henry VIII. died on a Thursday, as did also his son Edward, and his two daughters, Mary and Elizabeth. I have little doubt they came to look upon Thursday as their unlucky day. I have nothing much to say against Mondays except that I started work on that day many years ago (by a strange coincidence on April 1st), and have had to restart on many Mondays since. Monday is my nervy day because it is the one day in the week on which my mail includes many letters addressed to "The Dreamer." It is the day on which I receive letters telling me what people think of me and my "Reflections," owing, no doubt, to their having plenty of time on Sundays to run the rule over me. And, I don't mind admitting it, it is not always complimentary.

The anonymous letter is supposed to find its way quickly to the waste paper basket. Mine do not meet with such an untimely end. I save them up. I have a huge pile of them. When somebody writes to tell me that I am "A true English Gentleman," or something of that sort, I just run over my letter file and find out I am nothing of the sort, but something altogether different. I have been called by an endearing term by a lady who forgot to put her name and address, and I have been called something very different by a gentleman who had no objection to giving his full name and address, following it up with the information that he weighed 168 lbs., and no fat.

Up to to-day, however, nobody had ever suggested that I was of German extraction—the blow fell this morning.

The letter came from Edinburgh, and it is signed in full by a sportsman with an honourable Scotch name, and written on note paper bearing double crests. Further than this with regard to his identity, I will not go. After all, it not so much who he is, as what he says about me, which I don't in the least mind telling.

When I say it was a letter, I am somewhat stretching it. The paper simply contained these words, "From ——. A British subject without one drop of English, Saxon or Teuton blood." Well, that is all right. I wouldn't for one moment suggest that the gentleman is of German extraction—his name certainly has nothing German about the look of it, though the exact pronunciation in the real old Scottish tongue may be beyond my capabilities as a linguist. I could have liked it better had he left "English" out of it. I am a bit touchy about England. I am as proud of being an Englishman as he is of being a Scotsman. When I assure him that I am not of Saxon

blood, so far as I know, I would not couple with that word "nor Scottish." However, I am inclined to think that he did not mean it exactly in that way, because he goes all out for being British. The fact is he feels sore with me because I used the word "England" last week, where he thinks I should have said Great Britain.

It is possible that on occasion I have made this little slip—many writers, careless like myself, have made it. But on this occasion I was speaking about England; about the effect of the Military Service Act on English businesses, with which effect I am in touch. It may well be that the same applies to Scotland, but I am a long way off, and have no knowledge, so I spoke of its effect in England, and did not mean Great Britain. However, we will not have bad blood between us over such a small matter. We in these islands are far too near and dear to each other to fall out over trifles, especially when no belittling was intended.

Enclosed with his letter was part of my sheet in last week's "FLIGHT." Interposed between the words "By the 'Dreamer,'" he has written a word intimating that I am Saxon, and follows on by writing "of Little England." He has underlined "country like England," and written in the margin, "D—— your England. Make it Britain." Also he enclosed a picture postcard with my *nom de plume* added at the end of a printed sentence, in French, in a way not complimentary. And now I hope my critic feels better. I think he must have been rather cross when he suggested in a very pointed manner that there is something of the Hun about me. I think he made that insinuation in heat, and without troubling much about facts or evidence. I am not aware that I have ever written one word in this page which would suggest that I am a disciple of "Kultur." I am quite sure I have written enough on the other side to cause me to find myself early one morning in a deep and damp moat at the Tower, if ever the "All Highest" comes to live at Buckingham Palace. In the event of that happening, I shall return to the land from which I came somewhat earlier than intended by nature that I should, but I can assure my correspondent that it will be to my own land, to the land from which our family sprung so far back as it is possible to trace, to a part of the land included in Great Britain: Great Britain, the land for which we are all fighting to-day—English, Scotch, Irish and Welsh, including all those sons from overseas.

It is true I come from a county where the people are all supposed to be silly—"Silly Suffolk" it has been called; but this does not hurt me any more than when my unknown correspondent suggests that I am a Hun. Silly we may be, but I am not so silly as to think him so silly as to think that I should be silly enough to be hurt by his silly insinuations.

Go to! son of a great and honourable people. You and yours have ever been a fighting race: fighting to your last drop of blood for your own land, fighting now to your last drop of blood for our united lands, and for civilisation. We are BRITONS. Here's to us.



At last it appears that things are beginning to move. After a few exploits that augured well for its future during the early part of the war, the activities of the R.N.A.S. have for quite a long time disappeared from the public view, records of its doings being chiefly confined to reports of machines chasing hostile seaplanes, which, however, managed to escape. The bringing down, by Flight-Commander Bone, of one of these visitors the other day, was indication that efforts were being made to justify the existence of the Naval Wing as a separate unit, and now comes the report of the raid on the Zeppelin base at Tondern, which gives promise of the recommencement of a branch of air work full of possibilities if energetically and consistently persevered in. I have no patience with those who shriek for reprisals in kind every time a German raider has succeeded in blowing up a few cottages and killing a few innocent civilians, as there are obviously other ways of retaliating. The recent raids on Zeebrugge and Tondern are one method. There are other places along the German coast and elsewhere, not outside the reach of our modern seaplanes. The difficulties are great and numerous, admittedly, but the last raid has shown that they are not unsurmountable, although apparently on this occasion three machines were lost. I do not wish to seem callous, but looking at the matter from a military point of view, the loss of three seaplanes, especially, as appears to be the case, the occupants are spared, is not a prohibitive price to pay for the destruction, even if only partial, of one of the Zeppelin sheds at such a stronghold as Tondern has been turned into. If we succeeded this time, in spite of the fact that warning was apparently, according to the German reports, given of the approach of our machines, in spite of look-outs on the North Frisian Islands, in spite of up-to-date anti-aircraft guns on the West Coast of Schleswig, and in spite of the Zeppelins that are said to be almost constantly patrolling that part of the North Sea, we should be able to repeat the performance there and elsewhere, whilst with summer weather coming along, the conditions for seaplane work on a more extensive scale should become more and more favourable. We all regret the loss of the services of the officers who manned the three machines lost, but if the work commenced in the earlier part of the war is to be carried on effectively sentiment must and will not stand in the way. The best way to stop the raids, as we have so often advocated, is to destroy the Zeppelins in their lair, and it is to be hoped that Tondern is only the beginning of a series of immediate attacks of a similar character.

* * *

The communication sent by Lord Northcliffe to the *Evening News*, and published on March 24th, although not containing much information not already known to readers of "FLIGHT," being necessarily of a somewhat vague character, brings up one or two points that may be of interest. It is, of course, well known that several types of machines are in demand, such as chasers, bomb droppers, and those used for artillery "spotting." Less

known is probably the extensive use made of machines for purposes of obtaining photographs in the various theatres of war. As a matter of fact, photography has for years proved an invaluable help in connection with aerial reconnaissance. By its aid any alterations in enemy entrenchments are easily spotted by comparing the picture taken one day with the picture previously obtained. It will be easily understood that aerial photography requires a special camera, since it is desirable to obtain as large and as clear a picture as possible, while at the same time a certain altitude has to be maintained in order to be moderately safe from the fire of the guns below. For this purpose the camera used is fitted with a long focus lens, and the usefulness of the camera as a chartographer when atmospheric conditions are unfavourable, is further extended by the employment of specially prepared plates and colour screens that will give a clear picture in spite of a slight ground mist. In this connection it would be interesting to know what became of the multiple camera invented some years ago by a German professor. The general principle of this camera was, if I remember rightly, that the lenses of the series of cameras converged, and that by cutting the prints obtained from simultaneous exposures with the different cameras, a complete picture was obtained which was not only an excellent bird's eye—or should it be an aviator's eye?—view of the country photographed, but which was absolutely to scale.

* * *

At a time like the present, when the general consensus of opinion with regard to aero engines seems to be that reliability is of greater importance than weight, or rather lightness, it is interesting to learn from Lord Northcliffe that such an authority on aviation matters as M. Blériot considers that all engines in use at present, German as well as French and English, are far too heavy. It might well be that opinions such as these held by a man of M. Blériot's standing may result in the production of a new type of aviation motor. It is a general rule that if the demand for a certain thing be sufficiently great and sufficiently insistent, that thing is usually forthcoming. Although M. Blériot has not up till now tackled the problem of aero engines, it would not be surprising if he, by his influence, were instrumental in getting a motor firm to produce the engine he wants. We shall see.

* * *

With regard to the mention made by Lord Northcliffe of two pilots well known on this side of the channel, it is worthy of note that M. Salmet, that pastmaster in the art of piloting Blériot monoplanes, was responsible for the organisation of the raid on Karlsruhe some time ago. Another French pilot, young de Lesseps, mentioned by Lord Northcliffe, will probably be less familiar to "FLIGHT" readers, although early followers of aviation will undoubtedly remember the name as being that of one of the pioneers in aviation. De Lesseps is stated by Lord Northcliffe to have pursued a Zeppelin for forty-five minutes and so severely damaged it that it fell a complete wreck in the German lines.

ÆOLUS.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty has announced the following casualty:—

Under date Mar. 24th: **Injured.**

Flight Sub-Lieutenant Richard E. Bush, R.N.

The Secretary of the Admiralty announces that the following four Officers and a Chief Petty Officer of the Royal Naval Air Service are reported to be missing after the attack of the 25th inst. by British seaplanes upon the German airship sheds in Schleswig-Holstein:—

Flight-Lieutenant George H. Reid, R.N.

Flight Sub-Lieutenant John F. Hay, R.N.

Flight Sub-Lieutenant Cyril G. Knight, R.N.

Midshipman Stanley E. Hoblyn, R.N.R.

Richard Mullins, C.P.O. Mechanic, 3rd Class.

The following casualties in the Expeditionary Force

have been reported from General Headquarters to the War Office:—

Under date Mar. 14th: **Wounded.**

Sergeant T. May, Royal Flying Corps.

Wounded.

Second Lieutenant R. I. Kirton, K.O. Scottish Borderers and R.F.C.

Under date Mar. 18th: **Missing.**

1st Class Air-Mechanic P. Shaw, Royal Flying Corps.

Previously reported Missing, now reported

Prisoner of War.

Lieutenant G. S. M. Insall, V.C., Royal Flying Corps.

Reported from Egypt:

Died of Wounds.

Second Lieutenant M. Girod, 3rd Cheshire Regt., attached R.F.C.

Wounded.

Lieutenant E. R. Pretyman, 1st Shropshire L.I., attached R.F.C.

PERSONALS.

UNDER the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriages and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

Casualties.

Lieutenant HERBERT FREDERICK BIRDWOOD, 20th London Regiment, attached R.F.C., who was officially reported on March 10th to be missing since March 2nd, is now reported to have been killed in an air fight over Valenciennes against overwhelming odds. He was the only son of Dr. Roger A. Birdwood, late Medical Superintendent of the Park Hospital, Hither Green, S.E., and Mrs. Birdwood, of Twickenham, and is the fourth nephew of Sir George Birdwood to be killed in the war. Lieutenant Birdwood, who completed his 22nd year only some three weeks before his death, was educated at Mount St. Mary's, Chesterfield, and the City of London School. He entered Peterhouse College, Cambridge, in October, 1913, and was reading for law. He had completed his first training in the O.T.C. on the outbreak of war, and having applied for a commission, was gazetted second lieutenant in the 20th London Regiment (Blackheath and Woolwich). He went to the Western front early in March last year, and was at the taking of Loos in September. In December he was attached to the R.F.C., with temporary rank as lieutenant. In the fight over Valenciennes he encountered several hostile machines, in one of which was Immelmann. A message subsequently dropped into the British lines by an enemy airman reported this, and stated that the pilot, Lieutenant C. W. Palmer, was wounded. The commanding officer of Lieutenant Birdwood's squadron writes that "his cheerful manner and ready wit made him as popular with the men as he was with all of us. To say that we have lost one of the best observers, one who was always ready and willing to go anywhere and do anything, is the least one can say."

Second Lieutenant D. A. GLEN, of the R.F.C., who was reported missing on December 29th, is now reported killed. He was the only son of the Rev. J. P. and Mrs. Glen, of Norwich, and was 19 years of age. At the beginning of the war he joined the Public Schools Battalion. He was commissioned to the K.O.S.B. Before taking up his commission he entered Sandhurst, where he became sergeant of his company. At Sandhurst he was selected for the Flying Corps. His first solo flight at Farnborough was on June 1st. In four days he got his pilot's certificate, and his wings on July 24th. He was at the front for over five months, and saw much service. He was recommended for decoration and promotion to flight commander, and was mentioned in despatches on January 1st. His fifteenth and last fight was on December 29th with six Fokkers, while acting as escort to another machine. Lieut. Glen, in 1914, when representing Taunton School, where he was educated, in the Public Schools Championships, won the steeplechase cup and gold medal in record time, and the bronze medal in the mile.

Captain REGINALD ARTHUR SAUNDERS, R.F.A., 7th London Brigade (T.F.), and Flight-Commander, R.F.C., to whose death reference was made last week, was born in 1894 and educated at Ovingdean Hall, Brighton, and Bedford. He entered the British South Africa Company's service, but on the outbreak of war joined the Officers Training Corps, obtaining a commission in the 7th London Brigade, R.F.A. He was attached to the R.F.C. from March, 1915, obtaining his pilot's certificate, and went to France in July last. He was mentioned in despatches in December, gazetted Flight-Commander, and awarded the Military Cross.

Major and Squadron-Commander ERNEST FREDERICK UNWIN, Army Service Corps and R.F.C., died on March 22nd at the Queen Alexandra Military Hospital, Millbank, from injuries received while

on duty on the night of January 31st. Born in January, 1881, he was the third son of the late Rev. C. E. Unwin and of Mrs. Unwin, of 7, Sunny Gardens, Hendon. He received his first appointment in the Army Service Corps in June, 1904, and in April, 1913, was gazetted to the R.F.C. Reserve. He was promoted Captain in December, 1913, and on the outbreak of war joined the R.F.C.

Lieutenant CYRIL WYNWARD BATTYE, Royal Berkshire Regiment and R.F.C., the only son of Lieutenant-Colonel Battye, Military Knight of Windsor, and Mrs. Battye, who, it was announced last week, was killed while flying on March 13th, was educated at Repton and Sandhurst. He gained his commission in the 2nd Royal Berkshire Regiment in August, 1914, and saw service in Flanders. He was severely wounded at Ypres in October, 1914, and again—in the trenches—in August, 1915. In 1914 he was a member of the R.M.C., Sandhurst, Cricket XI., and also played for Berkshire and the M.C.C.

JOHN RITCHIE LAIDLAW, who, on March 17th, was killed at Hendon through a fall from an aeroplane, was the son of Robert Laidlaw, of Auckland, N.Z. His age was 24.

Wounded.

Flight Lieutenant ERNEST NORTON, R.N.A.S., son of Mr. Clement W. Norton, Dolguan, Newtown (Mont.), is in hospital in France suffering from injuries to his foot, leg, and head received during a chase after Zeppelins. Lieut. Norton, who is Montgomeryshire's first airman, is 22 years of age, and was educated at Newtown County School. On the outbreak of war he left his motor establishment at Welshpool and rejoined his regiment, the Montgomeryshire Yeomanry, as a despatch rider. He was later transferred, and has been at the front several months.

Lieutenant EDWARD RADCLIFFE PRETYMAN, 1st Shropshire Light Infantry, attached R.F.C., is reported from Egypt as wounded. He is the second son of Major-General Sir George T. Pretyman, Beech Hurst, Camberley, Surrey, and a relative of Colonel E. G. Pretyman, M.P., Parliamentary Secretary of the Board of Trade. Born in 1894, he joined his regiment when he was 19, and got his promotion in February of last year.

Married and to be Married.

A marriage has been arranged, and will shortly take place, between WILLIAM HENRY DYKE ACLAND, Lieutenant, Royal 1st Devon Yeomanry, and R.F.C., elder son of Admiral Sir William Dyke Acland, Bart., C.V.O., and the Hon. Lady Acland, and MARGARET EMILY, eldest daughter of Mr. and Mrs. THEODORE BARCLAY, of Fanshaws, Hertford.

Flight Sub-Lieutenant MURRAY CHAPMAN, R.N.A.S., son of Mr. and Mrs. Capel Chapman, of Hove, was—at Christ Church, Lancaster Gate—on March 22nd married to Miss GARRY SIMPSON, eldest daughter of Mr. and Mrs. Garry Simpson, of 89, Lancaster Gate, W.

Items.

Temporary Captain LORD LUCAS, Hampshire Yeomanry, whose appointment from Flying Officer R.F.C. to Flight Commander is just gazetted, is in his 40th year, and is the only surviving son of the Hon. Auberon Herbert, and grandson of the 6th Earl Cowper. He was Under-Secretary for War, 1908–11, Under-Secretary for Colonies, 1911, Parliamentary Secretary, Board of Agriculture, 1911–14, and President of the Board of Agriculture, 1914–15.

THE AIR SERVICES IN PARLIAMENT.

In the House of Commons on March 22nd, Mr. Joynson-Hicks, at the request of the civic authorities of south-eastern coast towns, raised several points in connection with recent air raids. The civic authorities who saw Viscount French on February 28th proposed that when a report of the approach of enemy aircraft was received by the naval or military authorities, they should at once transmit the information to chief constables of districts likely to be affected, who should use their discretion whether warning should be given. In a recent raid Ramsgate station sighted enemy airships, but had to communicate with the Admiralty before notice was given to the Westgate craft to go up.

Last Sunday firing was heard in the direction of Dover, but no warning was given at Ramsgate till after the raiders had dropped bombs and disappeared. The opinion of the mayor was that if the siren had been blown earlier the children who were killed would not have been allowed to leave home to go to Sunday school. In the raid of February 14th the naval authorities had notice of it over an hour before the civic authorities received the information. He urged that the civic and police authorities should have warning the moment there was any idea of hostile aircraft coming over our coast.

He understood that on the occasion of the last raid, as well as on a previous occasion, the officers in charge of the anti-aircraft arrangements were not at their posts when the raiders appeared. Apparently also the naval and military authorities did not understand that soldiers and sailors under arms were entitled to fire their rifles at hostile aircraft without waiting for specific orders from an officer.

Mr. Pemberton-Billing said the Government had been warned of the air menace for eight years, but our present position in the air was one which reflected credit neither on the Government nor on the officers whose duty it had been to prepare to gain the supremacy of the air for us. In consequence of the agitation which arose eight years ago, the Government appointed a committee, which he for one had not taken very seriously, pointing out in the journal devoted to flight which he edited that it was evidently their desire to shift the responsibility for muddling along on to other shoulders. Now, after 18 months of war, after another agitation, the Government had adopted the same course and appointed another committee, the Derby Committee, to deal with the construction of aeroplanes for the Naval and Military Services. It seemed to him that while the Army and Navy were quarrelling as to who should possess the poor little air child, there was a danger that the child would fail to develop as it should. Adopting the Chinese principle, the Army had bound one foot and the Navy the other, so it would never be able to walk by itself unless there was some definite change of policy. Lord Derby was a man with a great public reputation, and the Government, finding themselves confronted by an outraged public, had thrown him to the people like a bone to a dog and then said that everything would be well. What qualifications had Lord Derby to decide the destinies of our Air Service? What could he do when sitting at the head of a table with a multitude of counsellors, some counselling him to build, and others—the little aerites—telling him we had so many machines here and there which were doing nothing.

Lord Derby had for his assistants some hon. and gallant gentlemen. He had also Lord Montagu, who quite recently in the House of Lords stood up for the Air Service and criticised the Government, pointing out the error of their ways in no measured terms. But what was the result? Within 24 hours he was roped in and was told to sit on the Committee. Then he had to confess, in another 24 hours, that he would like to say a number of things in the interests of his country, but, unfortunately, his lips were sealed. Then there was a gallant officer of the General Staff on the Committee. His peculiar knowledge of aeronautics was quite unknown to him, although he had been associated with aviation since 1904. Then there was Admiral Vaughan Lee, who had devoted the whole of his life to the noble profession of the sea, but as surely as he was capable as a naval officer, so surely was he ignorant as a babe in matters of aeronautics. He was the naval officer to whom this country was looking to solve the problem of how we should beat our enemies in the air. He feared that his name would be coupled with the names of other officers who had been sacrificed on the altar of the Government's ineptitude. General Henderson was a very able officer, but so far as the Air Services are concerned he had heard him referred to as the De Rougemont of the Air Service. Then there was Commodore Sueter, who is the father of the Naval Air Service, and he, together with Squadron-Commander Briggs, he said with a full sense of responsibility, represent the expert opinion on that committee. Under these circumstances it might be well for the Government to give serious consideration to the advisability of adopting the minority report of that committee.

Whatever efforts this committee made, it was likely to be reactionary. In view of the fact that both himself and several

other men were most anxious and perturbed over the present policy of masterly inactivity in the air and our present hopeless muddle, it might be well also for the Government to state exactly what were the powers and duties of the committee. He understood that in the last six weeks it had met on six occasions. That meant out of six weeks for over five weeks a policy either of pondering or of waiting to see had been adopted. Any board that was appointed for dealing with this very pressing question of the air should sit not once in six days but every day, and if necessary all day, until some solution was found for our third-class position as an air power. He considered our national pride had suffered a blow which it would take us many years and much labour to recover from. This great nation had to seek protection from our enemies in the air in darkness and impotence, and had to walk about the streets like a lot of huddled fools when all that was necessary was for the Government to grasp the nettle and not to funk and twist and turn in every direction to avoid a task which either they must accomplish or must make way for some other body of men to accomplish.

Our very national existence in the next 20 years would lie in the ocean of the air. Within the next five or ten years we might live to see the sky darkened by aeroplanes. The idea of a country owning 500 aeroplanes would be looked upon as a humorous event of the past. Within the next ten years some country would own 100,000 or 200,000 aeroplanes. In the course of the next few years small scouting aeroplanes, the cost of which was now about £600 or £700, would be reduced to about £100 or £200. That meant that even a little insignificant nation that could not afford to buy a battleship would be able to terrify the world with machines carrying 500 lbs. of explosives and which would be able to get from one place to another, say about 100 miles, in 50 or 60 minutes. What would be the striking power of any nation which possessed such a terrifying arm? It meant that if at some future date our relations with some other country, perhaps 100 miles or 200 miles away, became strained at 6 o'clock in the evening, it was quite feasible that if those relations were not attended to very rapidly, before six o'clock in the morning half our cities would be laid waste.

He never walked about the streets in darkness at night without a certain feeling that our country was suffering at the hands of the Germans an insult which would take a lot of wiping out. He did not want to wash the dirty linen of the Air Service on the floor of the House, but if there was no other way, if the Government is going to promise reforms when only alterations were taking place, if the only way to impress upon the Government the great importance of the question was to shame and shock the House, he should not hesitate to give facts and figures which would do much to shock them and would do a great deal, he hoped, to shame the House. He was told we had no pilots. Yet we had about 130 officers, holding His Majesty's commission in the Royal Navy and the Royal Naval Volunteer Reserve, trained at great public expense, who were doing second-class clerical work in the Air Department. We had 30 first-class pilots quill-driving instead of machine driving. There was something very rotten in a service which allowed that sort of abuse. The air pilot was an expensive man to train, but once he was trained he should be used as an air pilot and not as a civil clerk. Our Air Services were in a condition of suspended animation pending a decision which it seemed very difficult for the Government to arrive at. He would suggest that while this condition of suspended animation continued, the only thing the Germans were waiting for was, not decisions, but atmospheric conditions, to strike yet another, possibly appalling, blow at us.

He had been asked to suggest a possible solution for the present condition. He had in his hand a very brief synopsis of a solution of the existing chaos, muddle, and inefficiency which reigned in our Air Service.

He would briefly refer to one method which at least could be adopted to harness the material we had to let the work which was now in progress be carried on, and yet to prepare for the production of such an air fleet as would, within the next six or twelve months, gain for us an ascendancy which, once we succeeded in winning it, no Government would permit us to lose. There were four ways out of our present muddle. The first was the amalgamation of the Royal Naval Air Service and the Royal Flying Corps under the control of a board selected from the heads of those services. The second was the development of those two services on independent lines under one political chief. The third was a conjunction of the productive and financial department of these services, which would leave the operative side independent. The fourth was the creation of a new force responsible for the production of all air material and for all services which did not form an integral part of naval and military operations.

Dealing first with the amalgamation of the Royal Naval Air Service and the Royal Flying Corps, he said that this at first sight

seemed the simplest and most practical course, and were it not for the human element it would present the line of least resistance. Unfortunately, however, there was and always had been great professional jealousy between the Army and the Navy, and this jealousy had been intensified in the Royal Flying Corps and the Royal Naval Air Service through the overlapping of their spheres of operations. Any controlling board selected from those services would be subject to incessant intrigue, while a board chosen from the outside with no knowledge of the air would be utterly powerless, owing to its ignorance. One of the prime causes of the ineffectiveness of the Royal Naval Air Service was to be found in its divided control, whereby air stations were placed under various local senior naval officers. No arrangement which left this undisturbed could be tolerated. He held the method by which the air stations were controlled by the senior naval officers of the district responsible for the incidents of Margate and Ramsgate. It meant that it would take longer to get from the observer of the enemy aircraft to the pilot or commanding officer in charge of the squadron, who would be responsible for keeping the enemy aircraft back, than it did for the enemy to get from the enemy base to this country. It was hardly necessary to point out that the Flying Service started in this amalgamated form. Originally there was only one Flying Service, the Naval and Army branch, but by degrees they have gradually drifted apart, until they were one service no longer.

Dealing with the independent development of the Air Service under one political chief, he said this might be a very effective eye-wash if they could find a politician of note who would be foolish enough to take on such a post. It would, however, leave all the existing abuses without any effective remedy, because such a chief would be entirely at the mercy of the controlling influences that were responsible for the present muddle, and the people who advised him one way or the other would confuse him so that he would find it even more difficult than the Government did to arrive at a decision. As to the conjunction of the productive and financial departments—this had already been attempted in the formation of the Derby Committee. The progress so far had not been encouraging. The departments which retained executive control were not likely to assent to the transfer of their administrative powers to a third party, or, if they gave a nominal assent, were not likely to give that hearty support which alone could render that assent of practical value. In any case the present failure was not so much on the side of production as on the side of operation. No improvement in production, however great, could possibly make up for our inefficient combative conditions.

Coming to the last point, the question of the creation of a new force, he said the supremacy of the air lay ready to any Government which had sufficient initiative to see to it. The thing would never be done under Government departments overburdened with other duties, which must naturally to them be of greater importance. The energy, vigour, and initiative required could only be found in the creation of a new, free force, free from the inertia of the Royal Naval Air Service as regards operations, and from the blunders of the Royal Flying Corps as regards contruction. He did not intend to deal with the colossal blunders of the Royal Flying Corps, but he might refer briefly to the hundreds, nay, thousands, of machines which they had ordered and which had been referred to by our pilots at the front as Fokker fodder, with regard to which every one of our pilots knew, when he stepped into them, that if he got back it would be more by luck and by his skill than by any mechanical assistance he got from the people who provided him with the machines. He did not wish to touch a dramatic note, but if he did he would suggest that quite a number of our gallant officers in the Royal Flying Corps had been rather murdered than killed. The changes in the administration of the Royal Naval Air Service about July last were made on the ground that the service was not sufficiently naval. These changes were in effect an attempt to reduce the Royal Naval Air Service to its purely naval functions. Assuming that idea to be sound, it might be shown that only a portion of the existing Royal Naval Air Service material and personnel was needed for such functions, and from the small portion of the remainder it was quite feasible to provide the nucleus of a new Imperial Air Service.

The duties of a naval aeroplane are limited to scouting, driving off enemy scouts, spotting for shots, and defending the Fleet from aerial attack. If our Grand Fleet possessed one machine which was capable of landing on a battleship, which was capable of helping the Grand Fleet further than the usual seaplane carrier, which had not been found a great success; if we possessed one aeroplane out of all the thousands of aeroplanes both delivered and on order for the Royal Naval Air Service, if we had one officer out of the many hundreds of naval officers and pilots in the Royal Naval Air Service, if we had one mechanic out of the 10,000 or 12,000 mechanics at the disposal of the Royal Naval Air Service who were really of material assistance to our Grand Fleet, he would say that

perhaps there was some justification for the system. He was going to suggest that the Royal Naval Air Service was at the present moment no use whatsoever to our Grand Fleet. It was a tragedy that such should be the case. It was a tragedy that, while the German Fleet had 50 eyes, nay, a hundred eyes, our Fleet was blind. Our Fleet possessed no rigid airship to help it. It possessed no machine which in ordinary, or slightly extraordinary, weather conditions could assist it in any way whatsoever. Without letting one's imagination run very wild, he would suggest that if the German Grand Fleet, which had many eyes, engaged the British Grand Fleet, which was blind, our Fleet would be operating under conditions which were not favourable to a very great and very serious occasion.

He suggested that immediate steps should be taken to ascertain exactly what provision our Grand Fleet demanded. Someone should be made responsible to inquire what facilities they possessed at the present time, either for spotting, or preventing our enemy airships from spotting either their position or their movements. He considered, so far as the present moment was concerned, that one of the gravest and most important problems to be solved was to see that our Fleet was, at least as far as observation went, on equal terms with that of the enemy, if and when it might or did come out. So far as the duties of the Royal Flying Corps were concerned, he thought its legitimate functions were limited to spotting, to attacking certain enemy bases only so far as they supplied the immediate army in the field, and to spotting gun shots and general observation. But quite outside that there were legitimate functions for an Air Service. There were legitimate functions for a great Air Service. There was no reason why every Zeppelin in Germany should not be blown up within the next six months—no reason whatsoever. If only we could give those men who understood the problem and had the imagination to deal with it, a free hand, he was satisfied that we should regain supremacy in the air. So long as we were content to appoint committees with very small powers, so long as we were content to allow these committees to meet once a week, as if this country was at peace, instead of at war, so long as we took no definite action he was afraid we should remain as we were—at the mercy of our enemies in the air.

He asked that if it was to be a subject of debate it should be made a subject of a very early debate. It seemed a pity if such a debate could not take place. If the Government decided to appoint a board and not a committee—a board with administrative power, a board with the power if necessary to dictate—on that board there could be represented all and every side of the great air problem. He suggested that this board should be directly responsible to the present First Lord of the Admiralty in the capacity of Air Minister apart from his present position. He understood the First Lord was responsible in the House for the air, and he did not see any reason why he should not continue to enjoy that distinction. If such a board were brought into existence at once the manufacturing resources of the country could be really tapped instead of being toyed with as they were at present. He had heard of 11 or 12 firms definitely telling the Admiralty within the past few weeks that unless they got aeroplanes to build they would have to go out of existence; he had heard of from 50 to 100 firms agitating with the Admiralty to be put on the list to build aeroplanes; and he had heard that 29 aeroplanes were discovered somewhere in the North, but discovered so late that they were obsolete. To whom were we to turn to put an end to all this muddle? What was wanted was the name of one man to whom we could turn to solve the problem, one man whose sole duty it would be to provide adequate defence until such time as our means of offensive were so great that the policy of defence would be unnecessary. It was because of the nature of the material which he possessed as to the present state of things—material which he would place before any Committee of authority—that he had decided to recommend those proposals to the gentlemen on the front bench who had so nearly and truly at heart the welfare of the country.

Mr. Tennant said the hon. gentleman had used strong language in relation to the Air Service, presumably in order to impress the Government with the importance of the question. But if the hon. member had done him the honour of listening to a few remarks he had made recently in the House, he would have known that the Government required no such language to make them realise the great importance of the matter. The Government were thoroughly alive to the great importance of providing sufficient aeroplanes for the protection of our shores and attacks upon the enemy. For the first eight or ten months of the war the Germans hardly dared to go over the British lines at all, showing how greatly superior we were in men and material. The amazing thing was that the Germans had not wakened up earlier to the situation, in order to encounter us in the air. They had done so now, they had provided themselves with better machines than they had formerly possessed, though not machines as good as ours—and at this late period of the war they

had arrived at the position of being able to encounter our airmen in the air.

To say that the Germans were vastly superior to us, and that we were only in a third-class position, was not only grotesquely absurd but absolutely untrue, and any hon. member who spread abroad statements of that kind, which might receive credence outside, was doing a very bad service, indeed, to his country. Our Air Service was efficient; it was doing good work at the front, and Sir Douglas Haig was satisfied that he was provided with all he required. When Sir Douglas Haig asked for more aeroplanes and larger squadrons of the Flying Corps he would get them as fast as they could ever be turned out. When the hon. gentlemen said that no raids were carried out at the front by our service he said that which was not true. The raid on Zeebrugge was a credit to our Naval Air Service. He had had a letter from one of those splendid young fellows in our Air Service describing a flight to Cambrai, where he dropped bombs on the aeroplane and Zeppelin sheds, and successfully returned, with many holes in his machine, but himself unhurt. Any one who took the trouble would know that air raids were taking place quite constantly. The hon. gentleman was also singularly misinformed when he talked of Sir David Henderson being the de Rougemont of the Air Service. The country owed a deep debt of gratitude to that gallant gentleman for our first-class machines and our wonderful men.

The hon. member used the word "murder." That was a word that ought not to have been used, and his application of it was untrue.

Mr. Pemberton-Billing: I repeat that statement, and if the right hon. gentleman wishes to challenge that statement I will produce such evidence as will shock this House.

Mr. Tennant: I had hoped the hon. gentleman was about to withdraw the charge, which was a grave one. I absolutely disprove what he says, and should like him to produce his evidence.

Mr. Pemberton-Billing: I will take an early occasion to do that. (Cries of "Now.") I would suggest to the right hon. gentleman that out of the 65 machines which took part in the raid on Zeebrugge there were not 12 per cent. of our machines, that the majority were French and Belgian and not British.

Mr. Tennant thought that when the hon. gentleman came to reflect on what he had said he would retract it. No one had been guilty of murder.

Arrangements had been made between the Field-Marshal in command at home, the Home Office, and the Post Office, that the moment warning of an air raid was received it should be communicated to the police and civic authorities of the neighbourhood. He would like his hon. friend to go with him to the Horse Guards, where he would see for himself the arrangements which had been made and would be able to satisfy himself as to their perfection. As to accusations of want of energy in going into this business, he had made it his business to go over everything that had been done, and he was staggered, absolutely amazed, at the wonderful network which had been set up—a matter into which he could not go now. He would be delighted if the hon. gentleman would go across and see, under the superintendence of the Field-Marshal Commanding-in-Chief at Home, what was being done in that particular direction.

In regard to the question whether proper naval and military authorities were on duty at the time of the raid on the South-East coast, he would have thought the very fact that they secured a hostile aeroplane on that occasion was a sufficient proof of it. There were two or three of our aeroplanes, he believed, belonging to the Royal Naval Service, in the air at the time when the hostile aircraft arrived. A great difficulty confronted any defensive force—he was dealing, not with Zeppelins, but with seaplanes or aeroplanes, which were hostile and came across the North Sea at between 100 and 120 miles an hour. Within the range of the Dover, Ramsgate, and Margate area there was a large aerodrome belonging to the Royal Naval Air Service, and from that aerodrome aeroplanes and seaplanes were constantly in the air. There was great difficulty in ascertaining whether aircraft were friendly or hostile until they were sufficiently near. One might see them 10 or 15 miles off or farther on a fine, clear day, but one could not, until they came within three-quarters or half a mile, ascertain whether they were friends or foes. Supposing the Government were to give instructions to the civic authorities in places like Margate, Ramsgate, Deal, or Dover that whenever an aeroplane appeared a buzzer had to be blown and everybody go underground, he was sure that would be an exceedingly unpopular and a very foolish proceeding.

Mr. Joynson-Hicks: The right hon. gentleman must not misquote my request, which was that when the naval or military authorities knew that there were hostile aircraft approaching they should communicate that fact to the local authorities.

Mr. Tennant said he did not dispute that for a moment, and he understood that arrangements had been made with that object. He did not know whether they had miscarried or not at Ramsgate. The raid at Ramsgate which had been referred to took place early

in February, when none of our arrangements were anything like so complete as they were at present.

He hoped his hon. friend would not continue to attack the military and naval authorities by using the words "waking up." He did not think that was a fair statement. He repudiated the suggestion of supineness, lethargy, and want of appreciation of a serious situation. As to the contention that it would not be fair to put the responsibility of the defensive forces for this purpose in the hands of the Field-Marshal the Commander-in-Chief, he joined issue with the hon. member. It was surely desirable that these defensive forces should be co-ordinated and put into one hand. It would be a disastrous policy to have one service under one person and another in the hands of someone else, without any proper control over them. As to the complaint that the soldiers had no orders to fire at aircraft, a new order was issued the other day in order to clear up the matter which had given rise to some doubt in the minds of the military authorities. The same difficulty of ascertaining whether a seaplane or an aeroplane was a friend or foe really came in there. It would be disastrous, he thought, if the soldiers were to be allowed to fire upon any aircraft they saw in the air at any moment. We all knew what our enemy was. We often found him in the air without any sufficient sign by which to know that he was our enemy.

He agreed that persons on the South-East Coast, particularly that area which the hon. gentleman had mentioned, were deserving of every sympathy. It was to their great credit that they had shown no sign of wanting to go underground directly they saw a hostile airship or aeroplane approaching. On the contrary, the real danger was that they flocked out into the streets, and that showed the spirit of our people.

Mr. Ellis Griffith said he was always impressed after such discussions as that with the advantage which would result if they could now and then have a secret Session. It must be a great satisfaction if the Commander-in-Chief in France was satisfied with his air service there. He did not, however, quite understand the right hon. gentleman's statement in view of the relative progress which the Germans seemed to have made.

Mr. Tennant: In any new service such as this there must be development. One side develops quicker than another, then the other catches it up and perhaps gets a little ahead, and then the other side catches it up. That is the position.

Mr. Ellis Griffith did not think it was an altogether satisfactory position if directly we were in the ascendant we knew the enemy was going to be in the ascendant in his turn. He would like to know what were the powers of what was called the Derby Committee. He questioned whether Lord Derby could find time to attend to this very important work. He dissociated himself from what the hon. member for E. Herts said about Lord Montagu, who was, he thought, an excellent addition to the Committee.

Mr. Billing: I never suggested anything otherwise.

Mr. Griffith: Then they must take it he was a very exceptional man because he did not merit the censure of the hon. member for E. Herts.

What he would like to know was what were the functions of this Committee. Did it really in fact do more than try to get the Army and the Navy to work better together? Did it really do more than try and allay the jealousies, or rivalries, of those two Departments? Had it got any power of construction? Had it got any right to design? Had it got the right to order a single aeroplane in this country? Had it got any money at its disposal? Of course, the Under-Secretary, on behalf of the War Office, would be responsible in this House, but, as he understood it, he did not think this Committee had any responsibility. Its responsibility was simply to advise, and the advice might be accepted or not. It had no power to insist on its advice being taken, even on the most trivial points. Was that a real reform or not? He really did not think it carried them very much further. Speaking about the darkness, he understood that ten times more accidents had happened in London since the Lighting Order, due to the darkness of the streets, than from the attacks of the Zeppelins. More than that, although on this matter the point was one for experts, and he spoke subject to correction, he was informed that even under the present Lighting Regulation an aeroplane 20 miles off could see the lights of London now, and, of course, also the Thames. If that was so, what was the good of it, and if it answered no useful purpose why let it be done? It is not unworthy of mention that Paris did not deal with the situation as we did. Under those circumstances he thought it well worthy of the attention of the Government to consider whether the Lighting Regulations of London were really serving any useful purpose. If they were preventing the enemy from doing us injury, then so be it, but if they did not serve that purpose, while they were at the same time putting the people of London to inconvenience, then the matter was well worthy the attention of the Government.

There was another matter to which he would invite the attention of the right hon. gentleman. He was told that before one can be a successful pilot of an aeroplane you must have had at least 200

hours' experience in flying, and the facts brought to his notice were that, with perhaps one exception, there was no one in the higher command who had been a hundred hours in the air. He should like to get some official particulars as to this. [An Hon Member: "Abroad?" No, here. He was also informed, and it was no secret, that Sir Douglas Haig had not got an experienced airman on his Staff. That was a very serious thing. It seemed incredible. With regard to promotion, there was no seniority list in the Air Service, and the consequence was that if a man was not promoted he had got no definite complaint. In the absence of such a list, promotions ought to be very carefully guarded, and all these men who were risking their lives ought to be satisfied of the fact that the men at the head of the Service in high command were men who had gone through the mill.

Mr. Tennant: I had occasion to refer to Sir David Henderson. He has flown many hundreds of hours. We have also at the War Office another officer, who is Second-in-Command to Sir David Henderson, and he has flown hundreds of hours also.

Mr. Griffith said he should like to know whether either of them

has ever flown over the enemy lines in France. [An Hon. Member: "That is another point."] It may be another point, but it is not a bad point. It would be much more satisfactory—and he was not then referring to those two gentlemen, but putting it generally—for the men in this Air Service if they knew that the men at the head were really experienced and were taking part in flying in the War. At any rate, remember this, that Sir Douglas Haig had gone through the mill. He was a subaltern himself and has fought, and every man in the higher command in our Army and Navy has seen actual service. That is the point I make.

Reverting later to the Air Service again Mr. Griffith said that he did hope, on the occasion of the forthcoming debate, the right hon. gentleman would be able to give them some assurance that the Air Committee, with Lord Derby at its head, had got some power, and that it was not merely a consultative and advisory Committee, but with the executive power in its hands, and that it was co-ordinating the two Services—that is the Army Air Service and the Navy Air Service—and that it was a step in the inevitable development of an Air Ministry in this country.

THE DEFENCE OF LONDON, &c.

A MEETING called by the United Wards Club of the City of London was held on March 28th, at the Cannon Street Hotel, in support of the taking of adequate measures for the protection of life and property in the City against air raids. The chair was taken by Mr. David Haydon, president of the Club, and Mr. Arnold White moved the following resolution:—

"That this public meeting of citizens and inhabitants of the City of London respectfully urges upon the Government the pressing necessity for prompt measures being taken for the adequate protection of life and property in the City against air raids by the enemy, and considers the most effective means of affording such protection would be by the creation and maintenance of an efficient air fleet, in addition to, and independent of, the existing naval and military requirements, to enable this country to carry out a vigorous offensive in the enemy's territory."

Mr. H. de Vere Stacpoole, who seconded, said that people on the East Coast hoped that when Ministers again went down to the country they would get such a "dusting" as they had never had before. Let the country keep the Government as long as it liked—but in the British Museum.

Mr. Pemberton-Billing, in supporting the resolution, said:—I will clear the air with reference to my position to Mr. Tennant in the House of Commons. I went to the House of Commons to tell the truth. I have been advised by my many friends that if I tell the truth in the House I shall ruin what may otherwise be a promising political career. I did not go to the House of Commons to obtain for myself either a reputation as a debater or to enter upon a promising political career. A man of my age and service abilities—whatever they are—would not get into mifli in the middle of a war like this for anything so rotten as a political reputation. I went to the House of Commons because that is the only place in England where the Defence of the Realm Act does not handcuff your hand and sew up your lips. No power on earth is going to prevent me from saying what I know to be true in the interests of my country.

I spent a considerable time after entering the House of Commons in trying to get the ear of those people who were for eight years warned by coming events which cast broad shadows before them and who were warned by the Press, but did not heed. That Government was, and for some inscrutable reason still is, responsible for the defence of our Empire. If by wakening itself just for a moment the Government could bring the war to a close even only seven days sooner, they might perhaps save the lives of 20,000 or 30,000 men, who might otherwise die in those last days of the war. Wars have been won by the sword and lost by the pen. When the moment for signing peace comes we have to take care that the welfare of the Empire and generations to come is not forfeited for the sake of a patched-up peace. We want men with vision and forethought; we don't want old gentlemen who have let us in before to let us in again.

I only look upon a Zeppelin raid as an incident in a weak air service, and on the defence of London as an incident in a weak air service. What we want to bring about is something grander than the air defence of London. We want to demand of the Government that the money, brains, ability, and resources we possess shall be employed, and that we shall gain as soon as possible and maintain for ever the supremacy of the air. A great deal can be done for the cost of two days' war. Within six months I would guarantee that we should have supremacy in the air. For the cost of two days' war we could have such a fleet of aeroplanes as would darken the skies. We must do it.

We must have done with these intrigues in both Services—intrigues for place, for promotion, intrigues to save the face of blunderers, intrigues between high service officials and others. Whatever happens they should not let us down. I say those men

would be more honourable if they killed themselves. Whatever happens only one thing must occupy our minds: Don't let our country be let down. In the House of Commons the other afternoon, when I found one charge after another, one statement of fact after another, did not cause Mr. Tennant even to turn in his sleep, I felt that some awakening was necessary. I felt that if observing the rules of the House has brought us to our present pass, it was far better that they should be broken.

In a sense when I stated that some of our pilots had been murdered rather than killed I meant it, and I propose to prove it. To take a bright young man, keen and anxious to serve the country, and willing to die for it if any useful purpose can be served, to give him a piece of rotten material, to order him up in the air in a rain storm in a machine that can only climb 300 ft. a minute, and get along perhaps at 75 miles an hour, to fly over the enemy's country with three hours' petrol and a very meagre chance of being able to weather back to our own lines, to fly with an engine which is inefficient, to put him on a "dud" machine when we have the finest machines in this country—to send a young man like that to his death, to meet a machine which is fully equipped with machine-guns, which can climb at three times his speed and fly at twice his speed, to send him out to take photographs, knowing no skill of his will ever make up for the inefficiency of his machine—how should I describe the conduct of the people in high authority who allow this to go on?

There is no doubt this does go on, and I am going to prove it. I regret most deeply we have had to wash the dirty linen of the Air Service on the floor of the House of Commons in my earnest and eager endeavour to get something done for the country. I left no stone unturned between my maiden speech in the House of Commons and my first attack on the Government. I sought out all these people in authority, and I told them much more than I told the House. I told them I was prepared to prove to the hilt every statement I had made, both by oral and documentary evidence, and I was received most politely. That did not satisfy me, and it will never satisfy me. This country must be supreme in the air.

It has been suggested that I am a man of one idea. I glory in that accusation. Before many years have passed that one idea will occupy the minds of many men in this country and women too. Every inland town lies on the coast of the ocean of the air, liable to instant and violent attack. When you think that in about ten years' time countries will possess not 1,000 but 100,000 aeroplanes at the cost of a few battleships, it is a terrible thought. These aeroplanes will fly at a speed of 100 or 120 miles an hour. Their powers of mobilisation will be alarming. It means that if our relationship with another country 100 or 150 miles distant is strained at 6 o'clock in the evening, before we arise in the morning it will be possible for our principal towns and cities to be laid waste.

What does that mean? It means that although the aeroplane is a most terrible factor and arm in war to-day, if we only realise it, it is the winged messenger of peace. Before many years have gone by perhaps one blow such as I suggest will be struck, and when a terrible and bloody war is brought into the very houses of all the thinking people and all the controlling minds of a country, before use has warped their vision, robbed them of their sense of proportion, and accustomed them to the terrors of war—if that is brought home to them in hours instead of years, the people of the world will rise up and say:—"This must not be." But before that wonderful day comes we have got to prove ourselves, and when that wonderful day comes there will be a council of nations and there will be a chairman, and if we work now and strike now Great Britain can sit in the chair. (Cheers.)

Mr. J. M. Hogge also supported the resolution, which was carried unanimously.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

War Office, March 25th.
On March 23rd, General Townshend reported that his camp at Kut-el-Amara had been bombarded by enemy aircraft and guns at intervals during the period March 21st-23rd. His casualties, however, were slight, and the general situation remains unchanged."

General Headquarters (France), March 26th.

"One of our aeroplanes which went out yesterday has not returned."

French.

Paris, March 21st. Evening.
To-day one of our pilots brought down a German aeroplane, which fell in flames in the region of Douaumont. Last night our aircraft bombarded the railway stations of Dunsur-Meuse and Audun-le-Roman and bivouacs in the region of Vigneulles."

Paris, March 26th. Afternoon.

"During the night of March 25th-26th, two of our aeroplanes dropped sixteen large-sized shells on the enemy bivouacs at Nantillois and Monttaucon."

Paris, March 26th. Evening.

"This morning one of our pilots brought down a German aeroplane, which fell near our lines in the region of Douaumont."

Russian.

Petrograd, March 27th.

"The flights of German aviators along the whole Dvinsk front are growing more frequent, and at Dvinsk they dropped twenty bombs."

"The enemy dropped bombs on the station of Stolbitzi and at Raibanova, south-west of Minsk."

Italian.

Rome, March 23rd.

"Our aeroplane scouting expeditions ascertaining the presence of considerable rolling stock on the Vallobaca-Idria line, other aeroplane squadrons bombarded Oppachiasella, Costanjevica, and Nabresina, returning afterwards unharmed to our lines, despite the violent fire of numerous enemy anti-aircraft batteries."

"Enemy aeroplanes dropped bombs on Asiago and Telvo, in the Sugana Valley, where no damage was done."

Paris, March 26th. Evening.

The *Times* correspondent at Amsterdam, writing on March 20th, said:—

"The *Telegraaf* learns that one aeroplane was above Zeebrugge at 2 o'clock this morning. The German defence-guns fired furiously, the German guardposts feverishly exchanged light signals and everything betokened great activity on the Flemish coast."

"At about 4 o'clock a British squadron appeared and began to bombard the German positions."

"Further details published by the *Telegraaf* from Flushing show that a great fire was observed to be raging at Zeebrugge at 4 o'clock this morning."

"The Germans have recently greatly strengthened the Zeebrugge coast defences. Their submarines working in the North Sea during the last few weeks have Zeebrugge as their base."

"On Sunday afternoon an aeroplane, which was supposed to have been engaged on a raid on the English coast, returned to Zeebrugge, where every day captive balloons with lookouts ascend to a height of 6,500 feet."

Mr. James Dunn, writing to the *Daily Mail*, from Rotterdam, on March 21st, said:—

"As a naval and air base Zeebrugge is now of little value. The combined air and fleet bombardments have reduced the harbour to a chaos of crumbling masonry."

"Practically the only things to escape damage were two submarines, which were promptly submerged in the dock when the attack began. Three torpedo-boats were driven into the open sea to escape the falling bombs. They manœuvred within the charmed circle of the minefield, but were continually harassed by Allied airmen and forced further seawards, only to be chased by British destroyers as hounds chase a hare."

"The majority of the air bombs fell on Solvay Works, which caught fire, and in the harbour, where several minelayers were badly damaged. Eye-witnesses of the bombardment say that fire and death rained from the heavens on the stricken port, which now looks like a huge scrap-heap."

A Central News message from Amsterdam, dated March 22nd, says:—

"Although the Germans have taken every precaution to prevent the leakage of details in regard to the damage caused by the Allies' great air raid on Zeebrugge, a frontier correspondent states on what he declares to be absolutely trustworthy authority that the damage caused, especially to the coast batteries, was very heavy. A large

Rome, March 27th.

"This morning a group of hostile aviators flew over the plain between the Isonzo and the Piave with the object of damaging our communications in the rear and the bridges over the rivers. The attack failed completely. The accurate salvos of our guns brought down one machine near Ajello and a seaplane in the Grado Lagoon, while a third machine was brought down by rifle fire near the Priula Bridge on the Piave. Of the six enemy aviators a major, chief of the squadron, was killed, and the remaining five were taken prisoners."

German.

Berlin, March 22nd.
Three enemy aeroplanes were put out of action by our aviators in aerial engagements to the North of Verdun. Two of them came down behind our front to the north-east of Samogneux. The third crashed down in flames behind the enemy lines. Lieutenant Boelke has thereby brought down his thirteenth, and Lieutenant Parschau his fourth enemy aeroplane."

Berlin, March 24th.

"An aeroplane belonging to an enemy squadron which attacked Volovac, west of Lake Doiran, was shot down into the lake."

Berlin, March 26th.

"Near St. Quentin an English biplane fell into our hands, undamaged. After an aerial battle, a French aeroplane fell down in the Caillette Wood and was dashed to pieces."

Berlin, March 27th.

"Our airmen dropped bombs on the railway stations at Dvinsk and Wilmejk and on the railway depots between Baranowitschi and Minsk."

Austrian.

Vienna, March 21st.
Our aviators last night appeared over Valona and successfully bombarded the port and camp. They returned safely, in spite of the heavy enemy fire."

Turkish.

Constantinople, March 24th.
On the night of March 21st, our airmen effectively bombarded the enemy's camp at Kut-el-Amara."

From Other Sources.

number of guns were destroyed entirely, and others which suffered serious damage have now been sent back to Essen for reconstruction.

"Over 200 marines and artillerymen were killed, and the number of wounded must be very great, in view of the fact that one hospital train alone, which passed Ghent station from Zeebrugge, contained over 350 wounded men. It has been ascertained that some German aeroplanes were completely destroyed by the Allies' bombs, while one German aeroplane, which had ascended and became engaged in a fight with a French airman, was shot down by him, the German officer in it being wounded."

A correspondent of *Het Volk* on the frontier says that during the recent Allied aerial attack an aerodrome near Ostend and six German aeroplanes were destroyed. At Zeebrugge a German torpedo-boat was towed in by another torpedo-boat. It had six dead and thirty wounded on board.

Mr. W. L. McAlpin, writing to the *Daily Mail* from Paris on March 22nd, says:—

"Nothing that has happened since the attack on Vaux has caused such a sensation in the Verdun region as a balloon accident which occurred a few days ago. One of a group of 'sausages,' as the soldiers call them, was floating captive at the end of its cable 3,000 ft. high when the steel rope snapped and the balloon shot upwards, taking an officer with it."

"Suddenly an officer shouted out, 'He's jumped.' The watchers saw a little grey spot detach itself from the balloon and fall rapidly for some distance. The speck grew larger and those on the ground realised that the observation officer had confined his life to his parachute. He eventually landed safely near the French lines."

"Telling his story later, he said: 'I was at a height of 3,000 ft. when I felt a slight shock. I thought my telephone wire had given way. A minute later I noticed that the other 'sausages' near me were becoming smaller. Then I looked over and saw that the cable had snapped. I had already risen 1,800 ft. The wind was carrying me towards the Germans, and it was imperative to take immediate action. I tried to pull the rippling valve (which releases the gas), but the cord got entangled.'

"Climbing on the edge of the car I jerked at it in vain. All this time the balloon was climbing rapidly. I tore up my maps and papers to prevent them from falling into the enemy's hands, and threw the fragments overboard. Suddenly I remembered my parachute. As you know, every observation officer while on duty wears a special tunic with a parachute attachment. Opening the

box I tested the cord to see that it ran free, and then climbed over the edge of the car. At that moment I was at a height of 10,500 ft. Holding on with one hand I pulled the cord with the other, and let myself go. I must have dropped 150 ft. before the parachute opened. It was not a pleasant feeling, but when I saw the parachute wide open above my head I felt quite safe. I had a good look round, and to my alarm saw that I was drifting quickly towards the German lines. After that I don't remember anything until I reached ground 300 yards from the Germans. It had taken me twenty minutes to come down. I feel rather stiff to-day, but to-morrow I'll be all right."

The *Petit Journal* states that amid the débris of the Zeppelin recently brought down at Revigny were found the remains of a woman and a pair of woman's shoes. The general opinion in the district is that the passenger was a spy taken on board the airship to point out where the crew should drop their bombs. Unfortunately, all other indications are lacking as to the identity of the woman spy.

The *Daily Mail* correspondent at Athens, writing on March 22nd, says:—

"A telegram from Mytilene (an island in the Aegean) says that a German aeroplane from Smyrna flew over there yesterday and endeavoured to bomb the Allied warships in the port. No damage was done. The aeroplane, which was fired on, returned to Smyrna."

Mr. G. J. Stevens, writing to the *Daily Telegraph* from Salonica under date March 23rd, says:—

"A squadron of French aeroplanes, while passing over Lake Doiran this morning, had one of their number shot through by the enemy's guns. The aeroplane fell into the waters of the lake from a height of 7,500 ft. Both the pilot and the observer were killed. Fighting on the frontier continues with increased intensity in the artillery action on both sides."

Writing on the following day he says:—

"The fighting on the frontier between Ghevigli and Doiran was continued to-day with even greater intensity than yesterday. A squadron of twenty-two French aeroplanes bombarded the German encampments, causing, it is believed, considerable damage. The squadron was afterwards assailed by an enemy air-fleet, and a battle ensued in mid-air, which lasted for a considerable time. One German aeroplane was seen to drop into the enemy's lines, and is believed to have been destroyed. One French machine was badly damaged, but succeeded in landing on the Greek territory in our possession. Both the aviator and pilot were saved."

"During the last few days aerial activity has been on the increase. The enemy is also displaying similar activity. Zeppelins have several times tried to reach Salonica, but without success, as on each occasion they were detected in time and prevented. Several aeroplanes on both sides have been destroyed."



The *Daily Mail* correspondent at Salonica, writing on March 24th, says:—

"Yesterday French aircraft brought down a German aeroplane, which fell in the German lines. To-day 22 Allied bombing aircraft flew over the German positions, throwing a considerable number of bombs and causing great damage. In order to reply effectively to the French raids, the Germans have now new and swift machines. In an air fight to-day two French craft were brought down, one on enemy territory, but the occupants were able to burn their machine and gain the French lines, within which the other came down. This was manned by M. Jacques Richepin, son of the poet, who was slightly wounded in the thigh."

An Exchange message from Paris on March 26th said:—

"A captive balloon was brought down to-day on Lake Doiran, where we have made two important raids during the past forty-eight hours. This evening a Zeppelin was sighted near Salonica, and was energetically bombarded. It was unable to reach the town."

The *Daily Telegraph* correspondent at Rotterdam, writing on March 24th, said:—

"In the last two days there has been much Zeppelin liveliness over the North Sea. From the Dutch islands airships have been observed cruising in various directions. A message to hand this evening from Ameland reports the passage of 'a great airship' in a westward direction this morning. This wording suggests the possibility of a new and larger type."

Mr. G. Ward Price, writing to the *Daily Telegraph* from Salonica, on March 27th, says:—

"Between five and six this morning five enemy aeroplanes raided Salonica. Clear cut against the dawn in the sky, they cruised to and fro for half-an-hour above the town, surrounded by smoke-puffs from anti-aircraft shells, and dropping bombs. As usual, practically the whole of the damage fell on the civilian population. The first official list compiled by the Greek police shows that the following casualties were caused: Killed: Nine Jews, seven Greeks, two Turks. Wounded: 21, among them being Greeks and the Government Official Director of Finances. One bomb fell near the largest Greek barracks, and another close to the Prefecture. A bomb seriously damaged the Greek Ecole Normale. The greatest indignation prevails amongst the population of Salonica, many of whom rushed from their houses along the streets towards the country."

In a message from the same place Mr. G. J. Stevens says:—

"In to-day's air raid twenty bombs were dropped. Two of the German aeroplanes were brought down by French aeroplanes, which pursued them. One dropped in Lake Amatovo and the other in the British lines."



RAID ON ZEPPELIN SHEDS.

THE following announcement was issued by the Admiralty on March 26th:—

"An attack by British seaplanes was delivered yesterday morning upon the German airship sheds in Schleswig-Holstein, east of the Island of Sylt. The seaplanes were conveyed to their rendezvous close to the German coast by an escorting force of light cruisers and destroyers under Commodore Tyrwhitt. Three of the seaplanes which took part in the attack are missing."

"His Majesty's torpedo-boat destroyer 'Medusa' was in collision with his Majesty's torpedo-boat destroyer 'Laverock,' and it is feared that in the stormy weather which prevailed last night the 'Medusa' may have been lost, but no misgivings are felt as to the safety of the crew. Two German armed patrol vessels were sunk by our destroyers."

"No detailed report has yet been received, but from Danish Press messages it would appear that this operation, which was carried out within the enemy's waters, achieved its object."

German Version.

Berlin, March 26th.

"Five English hydroplanes ascended yesterday morning from two vessels, accompanied by a cruiser squadron and destroyer flotilla. They made an attack on our airship sheds in Northern Schleswig. Not less than three of them, including a battleplane, were brought down by our anti-aircraft section (which had been previously warned) on and east of the Island of Sylt. The occupants, four English officers and one non-commissioned officer, were taken prisoners. Bombs were dropped in the neighbourhood of Hoyerschleuse. No damage was caused."

Berlin, March 27th.

"In the morning of March 25th English naval fighting forces carried out an aeroplane attack on the northern part of the North Frisian coast. The aerial attack failed completely, as has already been reported in the Army *communiqué* of the 26th. Two armed

fishing steamers on outpost service fell victims to English vessels. Our naval aeroplanes attacked the English naval fighting forces, and succeeded in scoring a number of hits. One English torpedo-boat destroyer was seriously damaged. Of the naval fighting forces which we sent out immediately, only a few torpedo-boats came in touch with the retreating enemy in the night of the 25th to the 26th March. One of these torpedo-boats has not returned up to the present."

Other Items.

The *Politiken's* Esbjerg correspondent estimates that five German cruisers, twenty destroyers, five battle hydroplanes, and Zeppelin L.14 took part in the engagement.

The *Politiken* also says:—

"In spite of the fact that the British seaplanes did not achieve the destruction of Zeppelin hangars at Tondern, considerable importance must be attached to the attack, as showing that England's defence has not been neglected, and that the British authorities are busy in providing means to prevent Zeppelin raids. The attack was carefully prepared and boldly carried out."

Travellers who have arrived at Copenhagen from the south report that British seaplanes bombed the neighbourhood of Hoyer and Tondern, burning a granary at Randerup and bringing down a large German battle hydroplane, which was taken to Tondern by automobile on Saturday afternoon completely smashed.



Orders to Attack Raiders.

DR. MACNAMARA on March 22nd informed Mr. Ronald M'Neill that in the event of hostile aircraft being sighted at places where aeroplanes of the Royal Naval Air Service were in readiness, it was not necessary to obtain sanction from the Admiralty before such aeroplanes were allowed to go up to attack the invader.

The Dover Raiders.

INFORMATION received by the Press Association indicates that a second German machine was brought down after the raid on Dover, on March 19th. It is stated that a pilot proceeding to France engaged one of the raiders and brought it down in the sea, afterwards proceeding to his station in France. No confirmation of this is, however, to hand.

The New Air Committee.

REPLYING to questions by Mr. Pemberton-Billing, Mr. Lloyd George, on March 23rd, said that the new Air Committee would meet as often as would conduce to the most efficient transaction of their business. At present they met about twice a week. He would not like to state, without notice, as to whether it was proposed that the duties and powers of the Committee should be increased.

The Work of the R.N.A.S.

MR. PEMBERTON-BILLING also asked on March 23rd whether the First Lord of the Admiralty could give an assurance to the House that the Allied raid on Zeebrugge was not, so far as this country was concerned, an isolated and sporadic act of offensive air warfare, but was part of a well-considered plan for vigorous and repeated attacks on enemy aircraft bases and other points of strategic importance.

Dr. Macnamara replied that the Government had every intention of using to the utmost the air resources at their disposal for offensive as well as defensive operations.

An Apology by Lord Beresford.

IN the House of Lords on the 22nd inst., Lord Beresford inquired whether any officers of the Royal Naval Air Service had lost their lives through flying in experimental or faulty machines.

The Duke of Devonshire answered that there was no authentic record of a fatal accident to any officer. Last month two officers lost their lives while carrying out an experiment, though every precaution was taken. Experimental work was absolutely necessary, and there was never any difficulty in obtaining volunteers for it.

Lord Beresford explained the other day that he stated on what he thought good authority that naval officers had lost their lives through using faulty machines. He had since discovered that the statement was not correct, and he therefore expressed his regret to the House and the Admiralty.

R.N.A.S. Pilots as Clerks.

REPLYING in the House of Commons on March 23rd to Mr. Pemberton-Billing, Dr. Macnamara said since the establishment of the Air Department it had been necessary to employ trained pilots in the administrative work of the Department, in the same manner as, for instance, qualified gunnery and torpedo officers were employed in the Naval Ordnance Department. The Admiralty fully recognised the importance of not withdrawing pilots from the active work for which they had been trained, and this point was kept constantly in mind.

Mr. Pemberton-Billing asked whether it was a fact that 130 pilots had been employed at the Air Department in clerical work owing to the scarcity of clerks. Dr. Macnamara replied that he did not think it was the policy to employ them on purely clerical work to any extent. Certain of the officers had, as the hon. member knew, been engaged in the dangerous work of testing new machines. Some were medically unfit, having been incapacitated by accidents. In any case, the whole question was one that would certainly be kept in view. Sir H. Dalziel asked whether the First Lord was aware of the fact that so many pilots were employed as clerks when he said there was a shortage of pilots.

The Punjab Aeroplane Fund.

A MESSAGE from Lahore last week stated that the Punjab Aeroplane Fund had closed with a total of £96,000.

Aerial Offensive—A French View.

WRITING in *L'Œuvre*, General Verraux gives the following interesting views as to the future use of aircraft in war:—

"Instead of half a score of squadrons of twenty aeroplanes, we want fifty. I should like to see hundreds deployed in successive lines on the whole front where the enemy is making his effort. These lines should follow one another at close and uninterrupted intervals for five or six days, or as long as would be necessary to inundate the assailants' rear with projectiles."

The German Air Service Centré.

"THE newly formed German Air Staff is already showing great activity," says an *Evening News* message from Rotterdam. "Their headquarters are established in the Chateau de Rumbeke, the old seat of the Dukes of Flanders. About twenty high officers of the air service are living in the chateau, which is connected by telephone and telegraph with the various bases. Young air officers are trained on a racecourse adjoining the chateau, from which all Belgians are turned away."

"Zeppelin sheds are being constructed with remarkable rapidity. The one partly destroyed at Brussels last year has been reconstructed, and a large new Zeppelin is expected daily. Many Zeppelins were seen last night making trial trips over Belgium, particularly in the neighbourhood of Namur."

Zeppelin Failures.

THAT the improvements in Zeppelins have not proved so successful as some stories through neutral countries would try to make out, is indicated by the following message by Mr. A. Beaumont at Milan, to the *Daily Telegraph*:—

"News has been received in military circles in Rome to the effect that Germany intends to diminish greatly her production of Zeppelin airships, having realised that the idea of ever conveying large bodies of troops to land them in England is a dangerous illusion, and, on the other hand, that the military value of Zeppelins is extremely limited. The latest models built had numerous devices for enabling Zeppelins to rise more rapidly, and they were also more powerfully armed. Yet the fact that they can be reached by anti-aircraft guns, as was proved at Revigny and on the North Sea, has caused disappointment, the improvements not being as effective as was expected. There is a strong tendency among technical experts to abandon the construction of new Zeppelins altogether or limit their number very considerably."

In this connection the Dutch *Maasboek* says that Count Zeppelin, on March 22nd, in an address that lasted three-quarters of an hour before the Prussian House of Deputies, said that his airships were not so perfect as he desired, but that airships of greater carrying capacity were now being built.

The objects he was now trying to attain were that his airships should be able to cruise higher and carry more. New types of engines had to be tested under war conditions more hastily than in peace, and the possibility of losses had to be reckoned with.

American Aviators Lost.

ACCORDING to a Reuter message from Columbus (New Mexico) on March 21st, two aeroplanes belonging to the squadron sent to Mexico had not yet arrived at Casa Grande, and it was feared they are lost in the desert. The airmen had food for three days, and two small canteens of water.

War Inventions.

THOSE who are anxious to utilise their spare time in endeavouring to think out schemes and devices which shall be of assistance to bring the war to a conclusion, will be interested to hear that Messrs. Withers and Spooner, the well-known patent agents, of 51 and 52, Chancery Lane, W.C., have published a little pamphlet briefly outlining some of the directions in which inventive genius may usefully be turned. They will be pleased to send a copy to any of our readers who are interested, and apply to them at the above address.

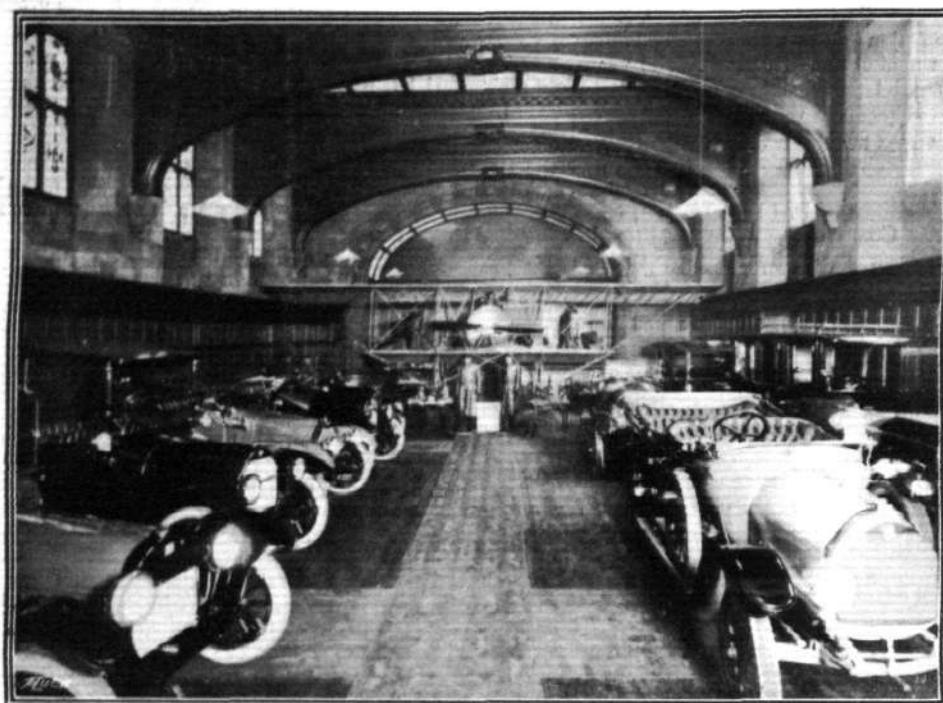
A Rotax Move.

EXTENSIONS at the Rotax Willesden works are now sufficiently advanced to enable the Rotax Motor Accessories Co. to commence removal of their warehouses and offices from Great Eastern Street and Curtain Road to Willesden. They anticipate the removal will be completed by Easter (some moving job!), and ask their customers' indulgence meantime for any shortcomings in the way of prompt delivery, as naturally all orders are being executed under difficulties. Meantime all correspondence should be addressed to Great Eastern Street as usual. A further announcement will be made later as to the date when the offices are transferred to Willesden.

Triplex Glass for Safety.

ANOTHER very extraordinary testimonial to the efficacy of Triplex Safety Glass has just been received from a well-known doctor, who writes to the Triplex Co., 1, Albemarle Street, W., as follows:—

"On January 23rd, 1916, a motor bus belonging to the L.G.O.C., Ltd., skidded into my landauette, which was fitted with Triplex Glass. Although my car was very seriously damaged, not a piece of glass became detached from any of the five windows or windscreen in spite of the fact that one was cracked all over. I was flung into the large window in front and stunned, and the window was badly cracked, but owing to the fact that it did not break I was not cut, although the serious disfigurement due to bruising lasted several days. I think it practically certain that if this window had been fitted with ordinary plate glass I should have been fatally injured, as my head must then have been forced through the glass, with the most likely result that the main arteries of my neck would have been severed. Indeed, this very accident and result happened to a doctor in London the week I met with my accident. It may interest you to know that I had Triplex Glass fitted to my car after a lady had been brought into my hospital fatally injured by a piece of plate glass which had become detached from the window of her car in a collision."



Aviation at Harrod's Stores.—
A view in the hall which is
devoted to the sale of cars and
things aviaitic. The section
devoted to the latter is seen in
the far distance.

OLEO PLUGS FOR AMERICAN ENGINES.

Now that so many engines of American manufacture are in use in this country, it is essential that really good sparking plugs with tapered threaded portion should be obtainable. Occupying, as they do, such a prominent position for this particular accessory, it is only to be expected that the makers of the Oleo plug should have given this matter their attention, and we now learn that plugs of this make can be had from Messrs. Leo Ripault and Co., Ltd., of 64, Poland



An Oleo plug, with
taper thread for
American engines.

Street, London, W., with either $\frac{1}{2}$ in. or $\frac{1}{4}$ in. taper. Of the plugs themselves, other than as regards the above-mentioned fact, there is no need for us to speak; they are known for their merits by practically every user of a petrol motor of any type whatsoever, both in the United Kingdom and on the Continent. Suffice it to say then that these are of the usual Oleo standard of workmanship and of the type illustrated in the accompanying sketch.



UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finsbury Park and District (66, ELFORT ROAD, HIGBURY, N.).

Monthly Report.—The past month has been rather unfavourable with regard to weather, "March winds," &c., being especially in evidence, nevertheless quite a lot of flying has been done on all flying days. New machines are constantly being evolved. A biplane, *a la Avro*, by Mr. Richards; a Morane Parasol, by Mr. Barnard; and a straightforward mono., by Mr. Rayner, made their appearance during the month, all flying well, and bringing credit to their designers, Mr. Richard's biplane being especially noteworthy for its stability in a choppy wind. Other members flying consistently in all weathers include Mr. H. Mullin, Mr. E. Coleman, W. Hardinge, and S. Hex, all machines used being tractors. The twin-screw and tail-first types seem to have entirely disappeared from the club meetings, as it is many months now since the last was seen, members seeming to prefer the more difficult but infinitely more interesting types of tractors.

Scottish Ae.S. Model Ae.C. (5, DOUNE QUADRANT, GLASGOW).

Monthly Report.—On Saturday, March 4th, Mr. K. W. G. Pinney carried out some tests with his new tractor biplane (illustrated in "FLIGHT" on February 10th, 1916) at Maxwell Park, Mr. Wm. Foster and Mr. Jas. C. Balden being the official observers. Some good flights were made of about 10 secs. duration, and in spite of a few rough landings on wing tips, &c., no damage at all was done. When fitted with a slightly larger tail and more power better results should easily be obtained. No official flying meetings will be held until the end of the war, but any member who has a model ready for testing might communicate with the secretary.

PUBLICATIONS RECEIVED.

Over the Front in an Aeroplane. By Ralph Pulitzer. London: Harper and Brothers. Price 3s. 6d. net.

Notes on Screw Gauges. (Enlarged Issue 1.) Teddington: The National Physical Laboratory.



Aeronautical Patents Published.

Applied for in 1914.

Published March 30th, 1916.

15,328. M. R. PUTSCHER. Projectile discharger for aerial machines.

Applied for in 1915.

Published March 23rd, 1916.

13,674. F. H. ROYCE AND ROLLS-ROYCE, LTD. Aircraft propellers.

Published March 30th, 1916.

3,092. W. LANGSTAFF. Flying machine.
3,498. E. R. CALTHROP. Parachutes.
3,693. P. F. VASSEROT. Sighting apparatus or adjusting angles of aim on aeroplanes and automatically correcting errors of verticality.
9,276. A. E., H. L., AND H. O. SHORT. Folding wing aeroplanes.



[Owing to pressure in our columns this week, the concluding part of the "Popular Aeroplane" is held over.—ED.]

If you require anything pertaining to aviation, study
"FLIGHT'S" Index to Advertisers and "FLIGHT'S"
Buyers' Guide and Trade Directory, which appear
alternately in these pages—one each week.

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